

**SAN ANTONIO MISSIONS
NATIONAL HISTORICAL PARK
RESOURCES MANAGEMENT PLAN**



January 2001



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RESOURCES MANAGEMENT PLAN

Recommended By:

Chief, Resources Management and Visitor Protection,
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Date

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Date

Approved By:

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Date

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I. INTRODUCTION

This Resources Management Plan (RMP) for San Antonio Missions National Historical Park describes the resources of the park and their context; sets forth a management program that is responsive to these resources and identified problems or threats; and prioritizes specific projects to accomplish stated goals and needs. The RMP also identifies research needs and proposes a schedule of accomplishments designed to meet these needs. This RMP, along with the park's Statement for Management, General Management Plan (GMP), General Management Plan Amendment for Rancho de las Cabras, and Annual Performance Plan for GPRA, provides guidance to park managers for overall park management activities.

A. PURPOSE

The park was established by Public Law 95-629, Title II, November 10, 1978:

"In order to provide for the preservation, restoration, and interpretation of the Spanish Missions of San Antonio, Texas, for the benefit and enjoyment of present and future generations, there is hereby established the San Antonio Missions National Historical Park consisting of Concepcion, San Jose, San Juan, and Espada Missions, together with areas and features historically associated therewith," (the Espada Acequia, Espada Dam and Aqueduct, San Juan Acequia and Rancho de las Cabras).

Based on the park's enabling legislation, the park has developed the following statements of its mission and significance:

Mission Statement

We preserve, restore and protect in perpetuity the resources of San Antonio Missions National Historical Park. We provide for the public a greater understanding and appreciation of the Spanish colonial influence in the New World through interpretation of the historical and architectural values of the San Antonio Missions.

Significance Statement

San Antonio Missions National Historical Park contains the largest concentration of cultural resources from the Spanish colonial period in the United States. Many of these resources continue to be used today for irrigation, education, worship, and as active community parishes, making them a living link from the historical past to the present.

B. LEGISLATION

This RMP is tiered to the following Park documents: The Land Protection Plan (as amended); Cultural Landscape Report for San Antonio Missions; Mission Concepcion Cultural Landscape Report; Mission San Jose Cultural Landscape Report; Rancho de las Cabras Cultural Landscape Report; Scope of Collection Statement, Integrated Pest Management Plan; Fire Management Plan; and Visitor Services Project Report for San Antonio Missions National Historical Park.

Other guiding documents to this RMP include:

National Park Service Organic Act - The 1916 National Park Service Organic Act states that the purpose of the National Park Service is “.... to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

National Environmental Policy Act - The 1969 National Environmental Policy Act requires certain knowledge of resource conditions to direct and evaluate effects of management actions.

Endangered Species Act - The 1973 Endangered Species Act regulates a wide range of activities affecting plants and animals designated as endangered or threatened.

Migratory Bird Treaty Act - The 1918 Migratory Bird Treaty Act makes it unlawful to take or harm migratory birds.

Clean Water Act - The 1972 Clean Water Act mandates restoration and maintenance of the chemical, physical, and biological integrity of the nation’s surface waters.

Clean Air Act - The 1990 Clean Air Act sets limits on the amount of air pollution allowed in a specific locale.

National Park Service Management Policies – *These policies set Park direction for specific disciplines. These include: NPS-18 Guideline - Wildland Fire Management; NPS-28 Guideline - Cultural Resources Management; NPS-75 Guideline - Natural Resources Inventory and Monitoring; NPS-77 Guideline - Natural Resources Management.*

C. LOCATION

The park is composed of several non-contiguous units. The park’s approximately 819 acres are located along the San Antonio River, as it flows through the southern half of the city of San Antonio in Bexar County, Texas, and as it flows adjacent to the 99-acre Rancho de las Cabras site in Wilson County, Texas. This latter area was transferred from the State of Texas to the National Park Service in 1995, and became part of the San Antonio Missions National Historical Park. This site is approximately 32 miles southeast of downtown San Antonio near the town of Floresville, Texas.

II. RESOURCE MANAGEMENT OBJECTIVES

NPS Management Policies state that “each park will have an approved general management plan (GMP) which will set forth a management concept for the park; establish a role for the unit within the context of regional trends and plans for conservation, recreation, transportation, economic development, and other regional issues; and identify strategies for resolving issues and achieving management objectives”. The GMP for San Antonio Missions National Historical Park was amended in 1998 to reflect the addition of Rancho de las Cabras near Floresville, Texas as a component of the park. Each of the missions had a distant rancho, or small ranch, which provided it with necessary livestock. As the ranch for Mission Espada, Rancho de las Cabras was an integral part of the mission’s social and economic life.

This RMP addresses both cultural and natural resource goals. Coordination between the cultural and natural resource programs helps to ensure that activities are compatible with protection and management of both resources.

A. CULTURAL RESOURCES:

Cultural resources are defined as the sites, structures, districts, and objects associated with or representative of people, cultures, and human activities and events. The San Antonio Missions National Historical Park contains numerous cultural resources of both historic and archeological significance. The resources of the missions vary from the churches and conventos to ruins and associated structures. Obviously, some of these resources are more significant than others and must be handled with considerably more care.

One of the first steps in managing cultural resources is research to find out what resources are present and how to manage them properly. Many of the research studies required for the San Antonio missions will provide the information that is necessary before any major physical work begins on the resources. Data from other studies will be used in interpretation of the resources. A list of studies-both those that are underway and those to be accomplished in the future-will be included in the general management plan.¹

The park will work toward this goal by:

1. Obtaining knowledge of the cultural resources of the four mission sites and related areas, and the appropriate preservation techniques, and maintenance requirements sufficient to provide for their stabilization and maintenance.
2. Providing for the preservation and protection of the cultural resources of the four mission sites and related areas and maintenance requirements sufficient to provide for their stabilization and maintenance.
3. Providing all emergency cultural resource preservation treatments at the four mission sites and related areas to operate an ongoing, comprehensive routine cultural resources maintenance program.
4. Acquiring sufficient knowledge of the story of the San Antonio Missions and of the people who once lived here to ensure an adequate database for full interpretive development.
5. Working toward eliminating or appropriately mitigating all significant external and internal threats to the cultural resources of the four mission sites and related areas, and operate an ongoing monitoring program on their condition.

¹ Environmental Assessment – General Management Plan/Development Concept Plan; San Antonio Missions National Historical Park Prepared by Southwest Regional Office October 1981 page 72

6. Cooperating with the State of Texas, other government agencies, and private entities for the purpose of protecting historic resources of the four missions and related areas from adverse effects due to non-park uses and developments, and promote an understanding of the park and its relationship with other historic resources in the region.
7. Improving resource knowledge, understanding, appreciation, preservation, and protection by encouraging research.

B. NATURAL RESOURCES:

Because the original natural environment of the San Antonio missions has been extensively altered or destroyed by man's intervention during the past three centuries, the goals for natural resource management are limited to protecting and improving the condition of the existing resources and, where feasible, returning the condition and appearance of the landscape to a state which better reflects the spirit of the mission period. The latter must be undertaken only in coordination with management of the cultural resources and after sufficient research has been accomplished.

Recently introduced exotic vegetation would be replaced or supplemented with native species or with species introduced during the Spanish colonial period. Landscape rehabilitation would be undertaken where necessary, including buffer plantings to reduce noise or adverse visual impacts.²

The park will work toward this goal by:

1. Continue coordination between the natural and cultural resource programs to assure activities from each program is compatible with protection and management of both resources.
2. Maintain a resource management program that is in compliance with environmental laws and executive orders, department policies and NPS management policies, director's orders and reference manuals.
3. Develop and maintain inventory and monitoring programs to assure that management of the park's natural resources is proactive based on a thorough knowledge and understanding of the resources.
4. Cooperate with the State of Texas, other government agencies, and private entities for the purpose of protecting natural resources from adverse effects due to non-park uses and developments.
5. Promote an understanding of the park's natural resources to those outside of the park.

² GMP-October 1981 pages 80 and 81

III. THE ENVIRONMENT – CURRENT RESOURCE CONDITION

A. NATURAL RESOURCES

1. CLIMATE

Heat and humidity characterize the San Antonio climate during the summer months, with cooler temperatures during the winter. On an average of 116-days per year, the temperature rises to 90-degrees F. or above. Temperatures of 32-degrees F. or below occur on an average of 21-days per year. Humidity averages about 80% in the early morning during most of the year but drops to about 50% in the late afternoon. San Antonio has 50% of the possible sunshine in the winter and more than 70% in the summer.

September is the wettest month, with an average rainfall of 3.71 inches, and December is the driest with 1.46 inches. Thunderstorms occur during the late spring and summer months, but precipitation during the winter usually occurs as light rain or drizzle, and snowfall is rare. Heavy fog occurs, mostly in the winter months. Because San Antonio is only 140 miles from the Gulf of Mexico, the area is affected by tropical storms. The usual effect of such storms is heavy rainfall and potential for tornadoes.

2. GEOLOGY

San Antonio Missions National Historical Park is situated near the base of the Edwards Plateau, adjacent to the Balcones Escarpment and Blackland Prairie, in an area classified as the Rio Grande (or Gulf Coast) Plain (U.S. Department of Agriculture, 1991). The plain consists of level prairie and undulating hills dissected by the San Antonio River and its tributaries. Elevations on the plain range from 450 to 700 feet above mean sea level (MSL), with a general slope to the southeast.

Regional topography is primarily influenced by the Balcones Escarpment; a broad area of faulted limestone that forms the southwestern edge of the Edwards Plateau. The escarpment rises 1,000 feet above the prairie to the south and east, and reaches from Del Rio, Texas (160 miles to the west), through northern Bexar County, to Austin (70 miles to the northeast). The escarpment follows a northeast/southwest alignment through northern Bexar County (U.S. Air Force 1997b). The park is approximately 15-miles south of the Balcones Escarpment). Topography within the park is relatively flat.

Surface drainage within the park is into the San Antonio River, which originates within the City of San Antonio. Stream flow in this river during the summer months is 10 to 20 cubic feet per second; municipal and industrial discharges and urban runoff are the principal flow inputs (U.S. Air Force, 1997b). The regional drainage pattern in Bexar County flows almost entirely to the south and southeast from the Balcones Escarpment.

Bexar County is positioned over the Balcones and Luling fault zones. These fault zones are characterized by mostly east-northeast-striking, near-parallel, normal faults, although northwest-striking cross faults are present. The faulting has modified the local structure

of the bedrock units and caused development of secondary porosity in some strata (U.S. Air Force, 1997d). This area is a primary recharge zone for the regional aquifer. The downthrown side of the faults, as well as the dip of the sedimentary rocks, is predominantly to the southeast.

A thick sequence of sedimentary rocks and unconsolidated material ranging in age from the early Cretaceous to Quaternary underlies the San Antonio area (Barnes, 1974). The total thickness of this sequence ranges from approximately 4,500 to 5,500 feet. The surface geologic units overlie, in downward progression, the Marlbrook Marl, Pecan Gap Chalk, Buda Limestone and Del Rio Clay, which comprise the upper confining aquitard for the Edwards Aquifer. The Edwards Aquifer consists of three limestone formations and is the principal water supply source for the San Antonio area.

3. SOIL TYPES

According to the USDA Natural Resource Conservation Service County Soil Surveys, at least nine soil types (NRCS Soil Survey – Bexar County, TX – Series 1962, No.12) occur on or proximal to the mission area proper of the park (except Rancho de las Cabras). These include Lewisville (nearly level alluvial soil with silty clay, slow drainage, usually cultivated), Houstin Black terrace (upland level clayey soil, often cultivated or irrigated), San Antonio (undulating clay soil, very slow drainage, erosion potential is high, native vegetation or cultivated), Webb (sandy loam, naturally well drained soil, cultivated or irrigated), Trinity (nearly level alluvial clayey soil, slow drainage, native vegetation and pasture), Karnes (calcareous loam found on flood plains, naturally well drained, cool season crops such as small grain), Patrick (occur as terraces along streams that drain limestone prairies, calcareous clay loam, shallow soil, cultivation yields less than other soils), Hilly Gravelly Land (Calcareous loamy alluvium making up knolls and narrow ridges, used as pits and quarries, roadbed material, native pasture, mesquite), and Frio (limey alluvial soil, riparian areas, poorly drained clay soil, erosion and flooding, pecans) series.

At least 4 soil types occur at Rancho de Las Cabras (NRCS Soil Survey – Wilson County, TX, 1977). These include Aransus (firm clay terrace or bottomland soil, cultivated, poorly drained), Colibro Sandy Clay Loam (calcareous sandy clay on gently sloping uplands, range, moderate soil erosion), Saspamco Fine Sandy Loam (on breaks from terraces to uplands, range and improved pasture land), and Frio (see above).

4. WATER RESOURCES

Groundwater is abundant in most parts of Bexar County. Water is generally drawn from wells or springs that tap the Edwards's limestone and associated formations in the Balcones fault zone. The Edwards Aquifer is confined by the Glen Rose Formation at its base and by the Del Rio Formation at its upper surface. The aquifer is recharged partly by infiltration of rainwater and partly seepage from the surface rivers, but mainly through underflow of streams on the Edwards Plateau. It is recharged by the downward movement of surface water via surface openings, cavities, and sinkholes in the recharge zone.

Because of its high yield potential (highly porous materials), the Edwards Aquifer is easily susceptible to contamination in the recharge zone, but not in the areas underlain by the upper confining units of the aquifer system. Most of San Antonio Missions National Historical Park is located 15 to 20 miles southeast of the recharge zone.

Surface water quality in the San Antonio area is generally poor. Major problems include depressed dissolved oxygen levels and high levels of fecal coliform, chloride, sulfate, and high nutrient concentrations. According to the San Antonio River Authority, monitoring data also show that the water contains high levels of herbicides, pesticides and total suspended solids. The velocity of the river is low due to channelization and instream flood control structures. The generally poor water quality results from treated municipal sewage effluent and surface runoff. During periods of reduced flow, the water consists predominately of treated municipal wastewater, which the river cannot assimilate efficiently.

5. AIR QUALITY

The park is in Texas Air Pollution Control District 217, Region XIII, one of the sixteen air quality districts in Texas. Bexar County is in attainment for all criteria pollutants. The regulatory authority is the TNRCC, Air Quality Division. Bexar County is one of many counties for which the EPA has revoked the 1-hour national ambient air quality standard for ground-level ozone. Although the 1-hour standard no longer applies in Bexar County, the new 8-hour standard does apply. San Antonio is a Class II area as it relates to the Clean Air Act, meaning that it is an area with less ozone depletion potential than a Class I area. The Clean Air Act, amended in 1990, provides that emissions sources must comply with the air quality standards and regulations that have been established by federal, state, and county regulatory agencies. These standards and regulations focus on the maximum allowable ambient pollutant concentrations and the maximum allowable emissions from individual sources.

6. FLORA

Most of the park's 819 acres have been altered or developed during construction related to structures, streets, flood control and agricultural activities. What native vegetation remains contains relatively mature stands of vegetation that are somewhat representative of species that were present before development and urbanization of the general area. However, due, in part, to seeding exotic species, fire suppression activities, overgrazing, or farmland abandonment, much of the park is dominated by non-native grasses and other exotic species that are competing against, or have replaced, the natural vegetation. Some of the more dominant exotic species will be discussed in another section. Some of the native plant species that occur in undeveloped areas of the park include Little Bluestem (*Schizachyrium scoparium*), Mustang Grape (*Vitis mustangensis*), Rough-leaf dogwood (*Cornus drummondii*), Agarito (*Berberis trifoliolata*), Honey Mesquite (*Prosopis glandulosa*), Huisache (*Acacia farnesiana*), Anaqua (*Ehretia anacua*), Cedar Elm (*Ulmus crassifolia*), Sugar Hackberry (*Celtis laevigata*), and Pecan (*Carya illinoensis*).

A survey of roughly half of the present park acreage was conducted in 1981 (Van Auken). The park is located in the northern area of the ecological region designated by Texas Parks and Wildlife as the South Texas Plains. Historically, these plains were once covered with open grasslands and a scattering of trees, but in a few valley woodland areas, these were more extensive than today. Today, examples of primary vegetation of this area consists of thorny brush with common names such as mesquite, huisache, and spiny hackberry. The San Antonio River, tributaries leading into this river, and the acequia system all have created dense riparian vegetation. Typical vegetation in this area includes pecan trees, sugar hackberry, and cedar elm.

Fringes of other ecological regions transition into this general area. In the general missions area north of Rancho de las Cabras, the Blackland Prairie edges in from the east. It is characterized by fertile black soils. Much of the original prairie has been plowed to produce food and forage crops. Farther south, near Rancho de las Cabras, the Post Oak Savannah ecological region edges into the South Texas Plains from the east. The Post Oak Savannah region is characterized as patches of oak woodland interspersed with grassland.

7. FAUNA

Inventories for vertebrate or invertebrate taxa are either incomplete or nonexistent. A few isolated, often older, studies have been done. Often, casual observation has supplied other information.

A 1987 bird study showed that at least 127 species of birds have been observed in the park. Some bird species that are seen year round include Cattle Egret (*Bubulcus ibis*), Turkey Vulture (*Cathartes aura*), American Kestrel (*Falco sparverius*), Blue Jay (*Cyanocitta cristata*), Tufted Titmouse (*Parus bicolor*), Carolina Chickadee (*Parus carolinensis*), Carolina Wren (*Thryothorus ludovicianus*), Mourning Dove (Northern Mockingbird (*Mimus polyglottos*), European Starling (*Sturnus vulgaris*), Northern Cardinal (*Cardinalis cardinalis*), Golden-fronted Woodpecker (*Melanerpes aurifrons*), Great-tailed Grackle (*Quiscalus mexicanus*), Lark Sparrow (*Chondestes grammacus*), House Finch (*Carpodacus mexicanus*), and House Sparrow (*Passer domesticus*).

In the spring and fall months, a variety of migratory birds species, including warblers (e.g. Orange-crowned Warbler (*Vermivora celata*), Yellow Warbler (*Dendroica petechia*), Nashville Warbler (*Vermivora ruficapilla*), Yellow-rumped Warbler (*Dendroica coronata*), and raptors (e.g. Cooper's Hawk (*Accipiter cooperii*), Red-tailed Hawk (*Buteo jamaicensis*), Red-shouldered Hawk (*Buteo lineatus*)), have been detected at San Antonio Missions National Historical Park

Some of the common species of mammals detected in the park include Black-tailed Jackrabbit (*Lepus californicus*), Striped Skunk (*Mephitis mephitis*), Red Fox (*Vulpes vulpes*), Coyote (*Canis latrans*), Nine-banded Armadillo (*Dasypus novemcinctus*), Raccoon (*Procyon lotor*), and Opossum (*Didelphis virginiana*). Some other mammal species, whose range would encompass San Antonio Missions National Historical Park, include the Fox Squirrel (*Sciurus niger*), the Mexican Ground Squirrel (*Spermophilus*

mexicanus), the White-footed Mouse (*Peromyscus leucopus*), the javelina (*Docotyles tacaju*), and the Mexican Free-tailed Bat (*Tadarida brasiliensis*).

There are a variety of reptile and amphibian species whose range would include San Antonio Missions National Historical Park. Examples of herp species whose range would include the park are the Texas Horned Lizard (*Phrynosoma cornutum*), Texas Spiny Lizard (*Sceloporus olivaceus*), Texas Toad (*Bufo speciosus*), Northern Cricket Frog (*Acris crepitans*), Snapping Turtle (*Chelydra serpentina*), Coachwhip (*Masticophis flagellum*), Texas Indigo Snake (*Drymarchon corais*), and Checkered Garter Snake (*Thamnophis marcianus*). Three species of poisonous snakes have been detected in the park: Western Diamondback rattlesnake (*Crotalus atrox*), Eastern Coral snake (*Micrurus fulvius*), and Cottonmouth (*Agkistrodon piscivorus*). Copperheads (*Agkistrodon contortrix*) would also be within their range in the park.

Because of the San Antonio River and its environs, a variety of fish species are present. Spotted Gar (*Lepisosteus oculatus*), Red Shiner (*Notropis lutrensis*), Channel Catfish (*Ictalurus punctatus*), Yellow Bullhead (*Ictalurus natalis*), Mosquitofish (*Gambusia affinis*), Largemouth Bass (*Micropterus salmoides*), and Green Sunfish (*Lepomis cyanellus*) are examples of fish species found in the San Antonio River or its environs. Native freshwater mussels have not recently been detected in the San Antonio River within the general area of the park.

8. THREATENED AND ENDANGERED SPECIES

With the exception of a 1980 plant survey (Van Auken), there have been no surveys conducted specifically for Threatened, Endangered (T+E), Species of Concern (SOC), or Rare species. Nearby, Brooks Air Force Base (near Mission San Juan) in a recent Draft EIS (Draft Environmental Impact Statement, September 2000, Brooks City Base Project, Brooks Air Force Base, Texas) mentioned that no T+E species were found on the base. However, compared to this military base, habitat type in the park is more extensive and varied, with a larger and more complex vegetation component. Also, the parks of the National Park Service need to consider all federally listed T+E species, and all state listed T+E species when considering a project or management action. Additionally, species that may be on the verge of listing (federal Species of Concern, and state Rare species) must be considered.

Although data is presently lacking, based on the above older surveys, potential T+E lists and biologists information at U.S. Fish and Wildlife - Austin and Texas Natural Diversity - Austin, Audubon checklist for Bexar County, Texas Parks and Wildlife Internet Information, The Nature Conservancy Wings of the Americas information, USGS internet site, Texas A&M internet site on Texas fauna and flora, and books on plants and animals, a list of possible T+E, SOC, and Rare species has been generated. First, federally listed species, and then, Texas State rare species are listed and discussed at to the possibility of a particular species utilizing San Antonio Missions National Historical Park.

H. THREATENED AND ENDANGERED SPECIES, continued

The U.S. Fish and Wildlife Service has designated the following Federally listed, or proposed listed, Endangered, Threatened, or Species of Concern species to occur in Bexar and Wilson Counties (U.S. Fish and Wildlife Service, 3/28/00)).

Federally Listed Species found in, or a potential casual migrant of, Bexar and/or Wilson Counties (Species with no asterisk - Bexar County. Species with an asterisk – Bexar and/or Wilson Counties. Species with a ^ - Wilson County).

<u>Species</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Black-capped Vireo *	<i>Vireo atricapillus</i>	Endangered
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	Endangered
Jaguarundi ^	<i>Felis yaguarondi</i>	Endangered
Least Tern	<i>Sterna antillarum</i>	Endangered
Ocelot ^	<i>Felis pardalis</i>	Endangered
Whooping Crane	<i>Grus americana</i>	Endangered
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Piping Plover	<i>Charadrius melodus</i>	Threatened
Cagle's Map Turtle	<i>Graptemys caglei</i>	Candidate
Madla's Cave Spider	<i>Cicurina madla</i>	Proposed Endangered
Robber Baron Cave Spider	<i>Cicurina baroni</i>	Proposed Endangered
Cave Spider (no name)	<i>Cicurina venii</i>	Proposed Endangered
Vesper Cave Spider	<i>Cicurina vespera</i>	Proposed Endangered
Government Canyon Cave Spider	<i>Neopleptoneta microps</i>	Proposed Endangered
Robber Baron Cave Harvestman	<i>Texella cokendolpheri</i>	Proposed Endangered
Ground Beetle (no name)	<i>Rhadine exilis</i>	Proposed Endangered
Ground Beetle (no name)	<i>Rhadine infernalis</i>	Proposed Endangered
Helotes mold beetle	<i>Batrisodes venyivi</i>	Proposed Endangered
Mountain Plover	<i>Charadrius montanus</i>	Proposed Threatened
Ferruginous Hawk	<i>Buteo regalis</i>	Species of Concern
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Species of Concern
Mexican Hooded Oriole	<i>Icterus cucullatus cucullatus</i>	Species of Concern
Reddish Egret	<i>Egretta rufescens</i>	Species of Concern
Texas Garter Snake	<i>Thamnophis sirtalis annectans</i>	Species of Concern
Texas Horned Lizard *	<i>Phrynosoma cornutum</i>	Species of Concern
Comal Blind Salamander	<i>Eurycea tridentifera</i>	Species of Concern
Texas Salamander	<i>Eurycea neotenes</i>	Species of Concern
Big Red Sage *	<i>Salvia penstemoniodes</i>	Species of Concern
Correll's False Dragon-head	<i>Physostegia correllii</i>	Species of Concern
Toothless Blindcat	<i>Trogloglanis pattersoni</i>	Species of Concern
Widemouth Blindcat	<i>Satan eurystomus</i>	Species of Concern
Maculated Manfreda Skipper *	<i>Stallingsia maculosus</i>	Species of Concern
Mimic Cavesnail	<i>Phreatodrobia imitata</i>	Species of Concern
White-faced Ibis	<i>Plegadis chihi</i>	Species of Concern

8. THREATENED AND ENDANGERED SPECIES, continued

Although the above species have a great potential to be located in either Bexar and/or Wilson Counties, because of certain habitat types not being present in the park, it would be unlikely that some of these species would in San Antonio Missions National Historical Park. These are:

Black-capped Vireo - The Black-capped Vireo has not been detected in the park. These migrants spend the winter on the western coast of Mexico and nest April through July on the Edwards Plateau 15-20 miles away) and the eastern Trans-Pecos regions of Texas. The closest confirmed detection of this species was found northwest of the park approximately 15 miles away. The Black-capped Vireo prefers oaks for foraging, but can nest in semi-open rangeland with small trees combined with dense brush reaching to ground level separated by open grassland. Returns yearly to same nest. Breeds April through July. The park has no oak/juniper habitat, only isolated live oaks, and farmland fields and riparian areas that are fragmented by a some heavily used city roads and freeways. This is not suitable enough habitat to warrant formal surveys for this species (personnel communication with Scott Rowin with Biologist Brett Carre', USFWS, Austin, TX). However, casual, informal surveys will occur prior to a project, if that project involves dense stands of small trees and brush and occurs during the Black-capped Vireo's breeding season.

Golden-cheeked Warbler – Migrant that breeds in Hill Country March through July. It is extremely unlikely that the Golden-cheeked Warbler would be found in the park. It selectively utilizes an oak / juniper habitat. This type of habitat, commonly found in the Hill Country north of the park, is not present in the park.

Least Tern – No confirmed sightings in Bexar or Wilson County. Slight potential as a rare winter visitor. Prefers dry, flat habitat next to shallow water areas – small parts of the San Antonio River within the park's general area may be suitable.

Whooping Crane – A very rare migrant that could follow the San Antonio flood channel as they migrate north in April and arrive south in November to the Gulf Coast.

Madla's Cave Spider, Robber Baron Cave Spider, Cave Spider (no name), Vesper Cave Spider, Government Canyon Cave Spider, Robber Baron Cave Harvestman, Ground Beetle (no name), Ground Beetle (no name), Helotes Mold Beetle, Comal Blind Salamander, Texas Salamander, Toothless Blindcat, Widemouth Blindcat, and the mimic cavesnail are all species of the Edward's Aquifer or limestone caves in or near the Edward's Aquifer. The Texas Salamander is also present in the headwaters of creeks originating in the Edward's Aquifer area. There are no limestone caves in the park and the park is not adjacent to the Edward's Aquifer.

Cagle's Map Turtle – Found in the Guadalupe River System in slow moving stretches of water. Breeds in late spring / early summer. Eats aquatic invertebrates and shuns river basking. Unlikely to be detected in the San Antonio River within the park's general environs.

8. THREATENED AND ENDANGERED SPECIES, continued

The following Federally Listed Species have been detected, or have the potential to be detected in part of San Antonio Missions National Historical Park:

Bald Eagle – May be delisted by 2001. Breeds primarily in the eastern third of Texas, but winters wherever open water occurs. Potential for this species to be seen near tall tree roosts near the San Antonio flood channel in winter although sightings have been rare.

Jaguarundi – This “weasel cat”, slightly larger than a domestic cat can be found in South Texas Brush Country. They are endangered because the dense brush that provides habitat has been cleared for farming or urbanization. Prefer dense brush near streams. Breeds in November and December. Unlikely in Bexar County, but has been seen in Wilson County where it would be at its northern most range.

Ocelot –Larger than a Jaguarundi, it also prefers dense brush, and is negatively effected by brush clearing for farms and urbanization. Breeds in the fall. Like the Jaguarundi, unlikely in Bexar County and rare in Wilson County where it would be at its northern most range.

Mountain Plover – A potential winter visitor, this bird is somewhat similar in appearance to a killdeer. Its preferred winter habitat includes plowed fields and cropland. Hence, after a weedy field is plowed, there is potential suitable habitat for this species.

Ferruginous Hawk – A potential winter visitor, this large buteo feeds almost entirely on rodents. Although these hawks generally avoid intensive agriculture and human activity, it is possible a Ferruginous Hawk may roost in trees along the San Antonio River or the treed borders of fields.

Loggerhead Shrike – Fairly common in the fall and winter, this robin-sized bird of prey utilizes fence rows and shelterbelts of agricultural fields, farmsteads, suburban areas, and riparian areas. It captures small rodents and birds in open grass/forb areas and impales its prey on barbed wired fences. Breeds in Texas March-June.

Mexican Hooded Oriole – Possible summer breeder. Builds hanging woven nest suspended from trees. Inhabits palm trees, mesquite, cottonwoods, dry shrubs, and some riparian woodlands. These habitat types are present within the park.

Reddish Egret – Generally solitary but may associate loosely with other herons. Inhabits open waterways. Possible spring/summer breeder in flood channel areas (prefer islands) of the San Antonio River.

Texas Garter Snake - Possibly found in riparian areas or tall grass areas of the park. During the summer months, this 18-30 inch snake is active morning and evening.

8. THREATENED AND ENDANGERED SPECIES, continued

Texas Horned Lizard – May hibernate from fall to spring. Prefers warm, sandy, arid environments and is typically found in flat, open areas with little, vegetation. Seen at Rancho de las Cabras. Mating occurs soon after emergence.

White-faced Ibis – Uncommonly seen in the San Antonio flood channel. Prefers freshwater marshes. Roosts on low platforms of dead reed stems or on mud banks. Colonial nester, sometimes with other herons or egrets. Nesting populations have been reduced by agricultural pesticides. Can nest or winter roost in the area.

Big Red Sage – Found probably more north of San Antonio in the Edwards Plateau in seepage slopes of limestone canyons, but it might be seen in the park in moist to seasonally wet clay or silt soils in creekbeds, ditches, or acequias. Flowers in June-October.

Correll's False Dragon-head – Found in wet soils including roadside ditches and irrigation channels. Has the potential to be found in the acequia system and San Antonio River. Flowers in June-July.

In addition to federally listed species, the State of Texas has listed the following additional State Endangered, Threatened, or Rare Species to be found in, or a casual migrant of: Bexar County (unmarked), Wilson County (^), or both counties (*).

<u>Species</u>	<u>Scientific Name</u>	<u>Texas State Status</u>
American Peregrine Falcon *	<i>Falco peregrinus anatum</i>	Endangered
Arctic Peregrine Falcon *	<i>Falco peregrinus tundrius</i>	Threatened
Black Spotted Newt	<i>Notophthalmus meridionalis</i>	Threatened
Indigo Snake	<i>Drymarchon corais</i>	Threatened
Texas Tortoise *	<i>Gopherus berlandieri</i>	Threatened
Timber/Canebrake Rattlesnake	<i>Crotalus horridus</i>	Threatened
Wood Stork *	<i>Mycteria americana</i>	Threatened
Edwards Plateau Spring Salamanders	<i>Eurycea</i> sp.	Rare
Henslow's Sparrow *	<i>Ammodramus henslowii</i>	Rare
Zone-tailed Hawk	<i>Buteo albonotatus</i>	Rare
Guadalupe Bass	<i>Micropterus treculli</i>	Rare
Cave Myotis Bat *	<i>Myotis velifer</i>	Rare
Plains Spotted Skunk *	<i>Spilogale putorius interrupta</i>	Rare
Keeled Earless Lizard *	<i>Holbrookia propinqua</i>	Rare
Spot-tailed Earless Lizard	<i>Holbrookia lacerata</i>	Rare
Bracted Twistflower	<i>Streptanthus bracteatus</i>	Rare
Elmendorf's Onion *	<i>Allium elmendorffii</i>	Rare
Park's Jointweed *	<i>Polygonella parksii</i>	Rare
Sandhill Woollywhite	<i>Hymenopappus carrizoanus</i>	Rare
South Texas Rushpea	<i>Caesalpinia phyllanthoides</i>	Rare

8. THREATENED AND ENDANGERED SPECIES, continued

Although the above species have potential to be located in either Bexar and/or Wilson Counties, because of certain habitat types not being present in the park, it would be unlikely that the following species would found in San Antonio Missions National Historical Park:

Bracted Twistflower – Mostly on rocky slopes in juniper-oak woodlands. Flower in April-May. This habitat type is not found within the park.

Elmendorf's Onion –Found in deep sand soils. Flowers in April-May.

Park's Jointweed –Found in deep loose sands including disturbed areas. Flowers in spring-summer.

Sandhill Woollywhite –Found in open areas in deep sands including disturbed areas, flowering in late spring-fall.

The following State Listed Species (not already Federally listed) may be found in San Antonio Missions National Historical Park:

American and Arctic Peregrine Falcon – Although the Peregrine Falcon has been delisted from the Federal Threatened and Endangered list, it is still Texas State listed. The American Peregrine Falcon nests below tree line in North America. In central Texas, it is found usually as a migrant in the wintertime. The Arctic Peregrine Falcon nests in the Canadian arctic south to treeline, and migrates through Texas in the wintertime. Could use power lines and tall trees along the San Antonio River to roost and observe potential prey.

Wood Stork – Breeds in Mexico and migrates to Texas mud flat and wetland areas in non-breeding season. Rare to found in San Antonio flood channel. Usually roosts communally (sometimes in association with other species of wading birds) in tall snags.

Zone-tailed Hawk – This slender bodied buteo could occur rarely in the park. Habitat within the park supports this bird. Found in open deciduous area, often near watercourses. Can be found nesting in giant cottonwoods in riparian areas. Similar in flight to a Turkey Vulture

Henslow's Sparrow – A rare winter/early spring visitor whose range just touches on the park from the south and east (a greater chance for detection in Wilson County – i.e. Rancho de Las Cabras). Found as an individual rather than in flocks, it is found in weedy fields or cut-over areas where there are bunch grasses along with vines and brambles. A key component is bare ground for running/walking. Shy and secretive, when flushed flies low and jerkily with a twisting motion of the tail.

8. THREATENED AND ENDANGERED SPECIES, *continued*

Black-spotted Newt – This newt prefers warm, shallow waters with vegetative cover, such as those in ponds, ditches, and swamps. Aestivates in the ground during dry periods. Peak breeding in spring. Found in the southwestern gulf coast area, but may occur in Bexar County.

Guadalupe Bass - Usually found in the headwaters of perennial streams of the Edward's Plateau. However, one was sighted in a stream within the general environs of the park (personal communication – Texas Natural Diversity Database).

Indigo Snake – The largest snake found in Texas (up to 8.5 feet long), this non-venomous brown-black snake is found in Texas in South Texas Brush Country. It has been seen at Rancho de las Cabras in Wilson County, and is listed by the state as a possible detection in Bexar County. Breed in April.

Keeled-Earless Lizard – Possible park resident. Prefers sandy environments. More common on sand dunes and barrier beaches along the Gulf Coast. Dorsal color is green-gray or brown. Breeding time is unknown, but hatchlings appear in the summer months.

Spot-tailed Earless Lizard – Probable park resident. They prefer rocky desert flats, areas with sparse vegetation or mesquite-prickly pear associations. Most of these habitat components are readily available in the park. Eggs are laid in the spring, and perhaps again in late summer. Found in counties of central and southern Texas.

Texas Tortoise – Found in the South Texas Plains. State listed because of habitat loss, a low reproductive rate and over collection. Hibernates October through April. Identified by yellowish-orange “horned” plates. Very docile and primarily vegetarian. Bexar County is thought to be its northernmost range. Prefers open brush with a grass understory. Open grass and bare ground are avoided. When inactive occupies shallow depressions at base of bush or cactus.

Timber/Canebrake Rattlesnake – Found in heavily vegetated riparian waterways, lowland areas such as canebrakes or thickets and abandoned farmlands. Prefers dense ground cover such as areas with grapevines or palmetto. Primarily in the eastern part of the state (Bexar County is its western-most range). Venomous, it often lies in wait, until prey or intruder is within striking distance.

Cave Myotis – Roosts colonially, usually in caves, but also rock crevices, old buildings, carports, and under bridges. Hibernates in limestone caves of the Edward's Plateau in winter. Opportunistic insectivore probably within the environs of the park.

Plains Spotted Skunk – Possible park resident. Found in open fields, croplands, fence rows, farmyards, forest edges, and woodlands. Prefers wooded brush areas. This type of habitat is abundant in the park.

8. THREATENED AND ENDANGERED SPECIES, continued

South Texas Rushpea - Park presence unknown. Found in the South Texas Plains on very shallow sandy or clayey soil over calcareous rock outcrops and caliche hills. Flowers in spring.

In a survey conducted in 1981 by Dr. William Van Auken of the University of Texas at San Antonio, no evidence was found of the presence of any threatened or endangered plant species. However, new species have been listed since that time, and the park has doubled in acreage.

The National Park Service has asked all parks to inventory plant, herp, mammal, fish, and mammal taxa to 90% certainty by 2003. Parks have been grouped in to geographic groups (San Antonio Missions NHP is part of the Gulf Coast Network) to divide network allocated money to network selected proposals to conduct such work. According to direction from the Gulf Coast Network, plants and herps are scheduled to be inventoried first.

9. EXOTIC SPECIES

A variety of exotic floral and fauna species have been detected in the park. These include trees such as Chinaberry (*Melia azedarach*), Wax-leaf Privet (*Ligustrum quihoui*), Tree of Heaven (*Ailanthus altissima*), Chinese tallow tree (*Sapium sebiferum*), and Russian Olive (*Eleagnus angustifolia*). Exotic reed includes Giant Reed (*Arundo donax*). Exotic grasses include King Ranch Bluestem (*Bothriochloa ischaemum*) and Johnsongrass (*Sorghum halapense*). Exotic insects include Red Imported Fire Ants (*Solenopsis invicta*) and Africanized Honey Bees (*Apis mellifera scutellata*). Exotic birds include Rock Doves (*Columba livia*), European Starlings, and House Sparrows; freshwater clams such as Asian Clam (*Corbicula fluminea*). Blue Tilapia (*Tilapia aurea*), an exotic fish, is found in the San Antonio River. And, there are feral cats and dogs. Management concerns related to many of these exotic species are addressed in the park's Integrated Pest Management (IPM) Plan. An upcoming addendum to the IPM plan will address exotic vegetation in more detail.

10. LAND USES AND TRENDS

While the maintenance and manipulation of natural resources is an important part of managing the historic scene of the park, the health and stewardship of the park's present-day natural resources, in and of themselves, is important. Resource management involves balancing the use of natural resources to enhance the historic scene with the protection or enhancement of certain natural resource components.

Appropriate and compatible land uses within the park vary in relationship to existing land use, development patterns, cultural uses, and significant resource needs. Land uses that modify large resource areas or intrude significantly upon the historic scene are incompatible with the management objectives of the park.

Although some uses are incompatible with the purposes of the park, others are complimentary. It is an important precept of the area that private use of the historic structures for religious and community purposes continues. Although the historic farmlands (labores) connected with the missions are generally not being actively cultivated, agricultural uses associated with them are viewed as compatible.

Any increase in private development within the park is not viewed as compatible with the purposes and values of the park. Additional development compromises the integrity of park values and lessens the quality of the visitors' experience.

Adjacent land uses are often closely related to the purposes of the park. Intense development of these lands could have adverse impacts on the historic scene, visitor experience, and potential Federal or State Listed plants and animals. However, with proper site planning, screening, and design, these impacts can be minimized.

The State of Texas and the City of San Antonio are currently working on a Mission Trails project. The Trail's development is to be linked to the San Antonio River and the five historic missions, other historic features, parks and neighborhoods along its banks. The task is one of relating the river's varied land uses and attributes into a single urban design statement which has an identity of its own while relating to other parts of the city. The project includes street modifications; additions to the hike and bike trail system, public art, and increased city services.

The park learned in the spring of 1993 that an underground plume of Trichloroethene (TCE) had been expanding from Brooks Air Force Base toward the San Antonio River. The contamination potentially affects private property owners located within the park boundaries and tracts of land owned and/or managed by the National Park Service. Some properties already have TCE present within their bounds. Others are threatened should the TCE plume migrate. Brooks Air Force Base is monitoring the TCE plume and has initiated a cleanup of the contamination with oversight from the Texas Natural Resource Conservation Commission (TNRCC).

In anticipation of a potential base closure, Brooks Air Force Base and the City of San Antonio have been working on a proposed "city base" concept. The main components of this concept include a continued use of the base by the Air Force with significant portions of the Base's infrastructure being turned over to the city. Portions of the base would also be open to development by private companies. The park has had the opportunity to comment on a draft Environmental Assessment (EA) and the park is closely monitoring issues related to this proposal.

The City of San Antonio owns and operates Stinson Airport, which is just west of Mission San Juan. Stinson is located on 300 acres of land bordered by Mission Road, Roosevelt Avenue, 99th Street and Ashley Road. The airport serves as a reliever for San Antonio International Airport, accommodating small-to-mid size propeller and jet-powered aircraft. Overflight issues affect both Missions Espada and San Juan. The Air Education Training Command at Randolph Air Force Base in San Antonio uses Stinson Airport for T-37 jets to practice low approaches. The main concern is that these jets

routinely fly directly over Missions Espada and San Juan affecting the “sound” heritage as these two sites. The city is also proposing new facilities and increased usage of Stinson Airport that could have adverse impacts on the park.

B. CULTURAL RESOURCES

1. CULTURAL CONTEXT/THEME

San Antonio Missions National Historical Park comprises over 800 acres made up of 12 sites including the four major mission community sites of Concepción, San José, San Juan, and Espada. Rancho de las Cabras, a restricted access archeology site of Mission Espada’s ranch, is located approximately 25 miles to the south of San Antonio in the city of Floresville.

These eighteenth century missions, along with a small settlement, the Villa de San Fernando, and the presidio of San Antonio de Béxar, were the components of what evolved into the city of San Antonio. The four missions, approximately 2 ½ miles apart on opposite sides of the San Antonio River, along with the mission of San Antonio de Valero (now known as the Alamo), the town and presidio, stretched in a chain along the river. Valero was the earliest of the missions on the river, transferred in 1718 to the area from the west at the Río Grande near San Juan Bautista (across from modern day Eagle Pass, Texas) and known as Mission San Francisco Solano. Mission San José, founded in 1720, was the only one of the chain of missions to be originally established along the river, on the opposite side from its present location. It was also the only mission on the river to be ministered by Franciscans from the college at Zacatecas. The four others were administered by those from the college at Querétaro. Later, in 1772, the Quereterans were ordered to minister the California mission field and turned over jurisdiction of the San Antonio missions to the college at Zacatecas.

Missions Concepción, San Juan, and Espada were transferred from East Texas in 1731 to their present locations. The church at Mission Concepción is the least renovated eighteenth century Spanish colonial structure in the United States. The Espada Aqueduct, constructed in 1748, still transports water from the old river channel via an acequia, or irrigation ditch, to water farm fields near Mission Espada. It is the only continuously operating Spanish colonial aqueduct in the United States.

The natives who inhabited the missions were from the numerous bands of hunter-gatherers generally labeled Coahuiltecan who ranged throughout the area of Coahuila and south-central Texas to the coast. The challenge for the Franciscan missionaries was to site the mission communities in areas frequented annually by the migrant bands and to make sedentary life attractive to them by providing a steady food supply and protection from their traditional enemies, the Lipan Apache.

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

THE ORIGINAL INHABITANTS (Theme)

- Indian Meets European (Sub-theme)
- Changes in Native Life Due to Contact (Facet)
- Changes in social and Political organization (Sub-facet)

The missions along the San Antonio River were at their peak in the 1760s and 1770s. By 1772, after a prolonged struggle for water right usage and pasture lands (ranchos) with the Villa of San Fernando, the town finally prevailed. The town won the right to use water from the river by means of acequias (irrigation ditches) not just from San Pedro Creek as in the past. The population of the missions had declined enough that the town also won the right to ask for the use and ownership of grazing lands formerly set aside for the exclusive use of the missions for their livestock. Three lost their separate grazing lands, with Concepción and San Juan joining San Antonio de Valero on lands to the northeast of San Antonio in an area known as the Monte Galvan. San José hung on to a segment of their former rancho to the west of San Antonio, the rest of it falling into private hands and eventually becoming part of the site of the town of Castroville. Only Mission Espada was deemed to still have enough livestock to warrant keeping the Rancho de las Cabras.

The finality of the missions' decline came in 1794 when the missions along the river began to be secularized. Given its close proximity to the European settlement and the presidio, San Antonio de Valero was fully secularized in 1794 since it was declared that most of its scant native population was virtually unrecognizable from the rest. The other missions were partially secularized, with the native officials overseeing the daily activities of the communities and the missionaries remaining to serve as priests. Dwindling populations coupled with the deterioration of society resulting from the impending war for independence of Mexico from Spain led to the consolidation of missions with one missionary serving two missions. By independence in 1821, only one missionary remained. With the expulsion of the missionary orders along with others identified with Spanish rule, missionary communities became virtually dormant amidst the ruins of the rapidly deteriorating structures.

The recognition in 1841 by the legislature of the Republic of Texas of the Catholic church's jurisdiction over the former mission churches and associated properties marked the beginning of an effort to save the eighteenth century church structures from complete destruction. It was to continue and expand over the years into statehood not only under the auspices of the diocese and archdiocese, but also the San Antonio Conservation Society, the State of Texas, and after 1978, the National Park Service. By 1941, Mission San José had had its compound walls, Indian and Spanish Quarters, and Granary reconstructed and the church renovated becoming listed as both a state and national historic site in the same year. Today, the four missions in the park are active parishes and a system of cooperative agreements outlining the parameters of administration dictated by the need to maintain the separation of church and state has allowed for the National Park Service to maintain those portions of each mission site not directly utilized by the parishes after the enabling legislation of 1978 created the park. Outlying areas, such as

Rancho de las Cabras, acquired from the State of Texas in 1995, are fully managed by the National Park Service.

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

EUROPEAN EXPLORATION AND SETTLEMENT (Theme)

- Spanish Exploration and settlement (Sub-theme)
- Southwest (Facet)

These are represented in the park's interpretive themes as outlined in the park's General Management Plan (GMP) of 1983. Mission San José has two themes: the Mission as a Social Center and the Protective Character of the Missions. Concepción's themes emphasize the objectives of missions to convert Indians to the Catholic faith and the influences of ecclesiastical traditions on life at the missions. Mission San Juan's theme is that of the Mission as an Economic Center, and that of Mission Espada's, the Mission as a Vocational Education Center.

2. ARCHEOLOGICAL RESOURCES

The park contains five primary archaeological sites of national significance: Mission San José y San Miguel de Aguayo, Mission Nuestra Señora de la Purísima Concepción de Acuña, Mission San Juan Capistrano, Mission San Francisco de la Espada, and Rancho de las Cabras. Other archeological sites include features associated with the missions themselves (acequias, dams, aqueducts, and labores) and features associate with the later 19th century and early 20th century community development.

Mission San José was first entered into the National Register of Historic Places as a National Historic Site on October 15, 1966. Mission San José was extensively restored and reconstructed as part of the Federal Work Progress Administration in 1930s with Harvey Smith, principal architect. The site was run by the state of Texas as a historic site from 1941-1978. This mission and surrounding lands became part of San Antonio Missions National Historical Park in 1978. An unknown amount of archeological investigation aided Harvey Smith's reconstruction efforts. Since that time there has been a number of archeological projects conducted prior to infrastructure development and stabilization work. These investigations have indicated a fair amount of undisturbed Colonial period deposits inside and immediately outside of the compound walls. A thorough survey and assessment of the entire site has not been conducted.

Mission Concepción was designated as a National Historic Landmark on April 15, 1970. While Mission Concepción was recorded by the Historical American Buildings Survey in 1936 and again in 1969, there was no federal involvement in its preservation until it became part of the boundaries of the newly established San Antonio Missions National Historical Park in 1978. The majority of the compound of Mission Concepción has fallen victim to urbanization in the area. While there has not been a through survey and assessment of the entire site, archeological investigations have indicated that there are

remnants of the compound walls and other architecture which survive beneath the ground surface.

Mission San Juan was listed on the National Register on February 23, 1972. In the 1930s as part of the Federal Work Progress Administration, the chapel was re-roofed and unfinished walls of the church across the plaza were partially rebuilt on the original foundations. Then in 1978, Mission San Juan became part of the San Antonio Missions National Historical Park. Mission San Juan has probably had the most extensive archaeological investigations of all of the missions within the park boundaries. Extensive excavations were conducted in 1967 prior to the rebuilding of the priests' quarters for the 1968 HemisFair. While a large amount of excavation has been conducted, a systematic survey and assessment has not taken place.

Mission Espada was also listed on the National Register on February 23, 1972. In the 1930s the ruins at Espada were stabilized as part of the Federal Work Progress Administration. Then, like the other missions, Mission Espada became part of the new national park in 1978. A small number of excavations have been conducted at Mission Espada in response to restoration and maintenance efforts. No systematic survey and assessment has been conducted.

Rancho de las Cabras was entered into the National Register on March 20, 1973. The State of Texas began proceedings to purchase the Rancho site in 1977 and completed the transaction in 1982. In 1991 the boundaries of San Antonio Missions National Historical Park were expanded to include other mission-related features including Rancho de las Cabras. In 1995 negotiations were complete and the 99.152 acres were transferred to the National Park Service. Extensive archaeological investigations were conducted on the ruins themselves from 1980-1984. Additional survey was conducted for the Cultural Landscape Report completed in 1998. A complete survey and assessment of all 99.152 acres has not yet been completed. The area was used for cattle grazing for the majority of its history.

The missions' construction brought with them an entire infrastructure of structures and devices with which to provide for the mission population. Included in the park boundaries is the Espada Aqueduct, which was entered into the National Register on October 15, 1966. It is the only known example of a Spanish colonial arch-supported water transportation structure in the United States. The main threat to the aqueduct is the ongoing problem with after-hours activities by local gangs. The rest of the features were entered into the National Register as part of the Mission Parkway District on October 6, 1975. Two of the dams built for the irrigation system still exist. Espada dam (41BX280) is still in use as part of the acequia system. The San Juan dam (41BX266) was thought to be destroyed by rechannelization in 1958 but was rediscovered in late 1982. The dam is overgrown with brush and silt. Two of the branches of the former acequia system are within park boundaries, Espada (41BX269) and San Juan (41BX268). Both have been modified through the centuries but portions of colonial construction remain. The Espada acequia is still in use and the San Juan acequia is currently under repair to have water reintroduced. Portions of the labores of Missions San Juan and Espada are also within

park boundaries and some of these are still used as agricultural lands. Encroaching urbanization near the park boundaries threaten these resources.

In addition to the above resources there are a series of archeological sites associated with the Mission Parkway historic district (see table) that are within park boundaries. These sites are all on the National Register as part of the historic district entered on October 6, 1975. These are the most threatened archeological resources in the park. The locations of these sites were not well recorded in the original survey and being under private ownership, many of these sites may have been modified or destroyed. A complete re-survey and assessment of these sites is necessary to determine the current state of preservation.

All of these sites are affected by the environment, visitation, and maintenance activities. A through survey and assessment of the park would greatly assist in minimizing the negative effects of these activities.

Appendix C contains a Summary Chart for Archeological Sites.

3. HISTORIC STRUCTURES

Preserved within the five units of the park (the four mission complexes, and rancho de las Cabras), and their related areas, are prehistoric and historic structures, sites relating to eighteenth-century Spanish Franciscan mission complexes. These are considered the primary resources for which the park was established.

Nineteenth- and twentieth-century structures, considered secondary resources, are found at the each of the sites. These structures consist of more modern additions to existing historic structures and structures adaptively rehabilitated over the years. These additions/modifications have achieved historic significance in their won right due to their age.

The four mission sites and their related areas comprise a National Register district—added to the Register in 1983. Rancho de las Cabras was entered into the Register separately in 1976.

The district's principal historic features are the structures of the missions. These were built initially from prototypes developed in medieval Europe and refined in the New World to accommodate specific, formalized functions. They consist generally of the following:

- an enclosing wall for confinement and defense, broken by gates at strategic or convenient places;
- a church for religious observances and a sacristy for the storage of vestments and sacred objects;
- a convento containing the friary, where the priests lived and worked, and other rooms for the storage and production of material goods; and
- the Indian quarters, a series of small attached rooms built, most frequently into the enclosing walls, to house the Indians of the mission.

After the mission lands and structures were divided among the mission Indians and "other deserving persons," the transition from a mission lifestyle to one more closely resembling a village or town required new architectural solutions. Old buildings were restored, reused, or left in ruin; new buildings were constructed.

In terms of architectural envelope, interior space, and sculptural embellishment, much of the eighteenth century character of the individual structures remains intact. Except in a few protected areas, notably at Concepción, the painted decoration has not survived. Church and convento exteriors formerly plastered and covered with ornate geometric designs are now bare stone with an occasional faint trace of color.

The visual character of the compounds as a whole, however, has changed dramatically from colonial days. At Concepción only a small part of the eighteenth century plaza survives in front of the church and convento; a modern fence encloses an area one-quarter the size of the colonial compound, with the remainder of that large space undelineated and crossed by a busy two-lane road. The compounds at Espada and San Juan are defined only in part, with broken walls and disconnected buildings surrounding the space which was originally the mission plazas. San Jose alone conveys, as a result of the extensive 1930's reconstruction work, a dramatic sense of the volume of the compound space and the character of its enclosing walls.

Mission Concepción:

The present church, completed in 1755, faces west and has a vaulted nave and transepts, two bell-towers each with a room beneath, and a dome at the crossing of the nave and transepts. It is 92 feet long and 53 feet wide across the transepts. The facade was conservatively decorated with carved stone, but had a brightly painted plaster finish. The sacristy adjoined the south end of the south transept, with a cell or office above it reached by a stone stairway. The convento was a row of vaulted rooms 92 feet long and flanked on each side by a vaulted arcade identified in the Spanish documents as the *corredor*. Workshops were contained in a cluster of stone buildings grouped at the south end of the convento and the adjacent granary, the latter built so as to project south from the sacristy. The Indian quarters stretched northward from the northeastern corner of the church 236 feet to the northeastern corner of the mission compound. The north wall of the compound, 406 feet long, extended from this corner to a point just west of the present line of Mission Road. Here the wall turned towards the south for a distance of 313 feet. These three walls apparently had Indian quarters built along them in a continuous row. The south wall extended along some portion of the 303 feet from the southwest corner to the west side of the convento. It may also have incorporated Indian quarters. These quarters were built of stone with flat earthen roofs and stone or adobe interior walls.

The fields of the mission were immediately outside its walls. They were about 130 acres in size and were planted in corn.

Mission San José:

The church of San José was completed in ca. 1780. It was built of stone and was 110 feet long and 33 feet wide across the nave. It faced to the west and had no transepts.

A single bell tower, accessed by a spiral wooden staircase built into a round tower against its east side, stood on the south side of the facade. A tower base with a parapet and false cannon had been built on the facade at the north. A sacristy with three low domes was built along the eastern end of the south nave wall. This structure opened into the church on the north and into the convento on the east. The facade of the church was decorated with ornate stone carvings, much more elaborate than those at Concepción, and similar intricately carved motifs surrounded the main window of the sacristy. Brightly painted plaster covered much of the church and convento. This convento, a two-story structure about 137 feet by 70 feet, had been begun before 1755, and probably before 1749. Offices, workshops and storage buildings were clustered in an area north and west of the church, while the Indian quarters occupied a square about 460 by 480 feet to the south of these groups. A protective wall enclosed the entire mission, and most of the Indian quarters, workshops, and offices were built against this wall and were of stone with flat roofs. Some structures may have stood within the square.

The farm of San José was more than 105 acres in size. It was planted in corn, beans, sugar cane, cotton, and peppers. The mission also had a large orchard.

Mission San Juan:

In 1780 the church of San Juan was temporarily housed in one of the buildings of the convento compound. It was 56 feet long and 14 feet wide, with what may have been a shingled, pitched roof. The structure had no bell tower, the bells being supported on an adjacent wooden framework. The church was located on the east side of the rectangular enclosure formed by stone-built, flat roofed structures on three sides and a single wall on the north. This convento compound was approximately 125 wide from north to south and 140 feet long from east to west. The friary occupied the west row of rooms. It was one story high with an arcaded *corredor* along its east side, facing into the compound. Also along the west, and on the south side, were other rooms, these used for work and storage. The compound was being expanded to include Indian quarters in a long rectangle directly north of the *convento* enclosure. Construction of these quarters on the north and west sides of the new wall, in the last stages of work in 1772, was probably completed by 1780. The present church of San Juan apparently did not exist at this time, but construction had begun on a new church, 80 feet long and 30 feet wide, with a sacristy of octagonal plan and a square tower. This structure was being built near the southeast corner of the present compound.

The fields of San Juan totaled a little more than 96 acres planted in corn and beans.

Mission Espada:

In 1780 Espada's church was a small building 39-feet long and 15-feet wide built as the sacristy for a larger church which was never constructed. Portions of this church, including the facade with its arched stone doorway, exist today as the Church of San Francisco de la Espada. The building had been designed to face into the west transept of the new church, but little more than the foundation of that larger structure was ever completed. The convento adjoined the small church and followed the same general plan as that seen at San Juan. Again, it was an enclosure of flat-roofed stone structures about 125 feet by 140 feet, with the friary and its east facing *corredor* on the west and the

workshops along the south. At Espada, however, the friary had a second floor. This upper level contained the rooms where the missionaries lived, while the first floor accommodated the offices and storerooms. Adjoining the convento compound on the south was a second compound, which apparently contained many of the more specialized workshops, such as those of the blacksmith, the carpenter, and the stone mason. The Indian quarters formed three sides of a square on the north side of the convento compound.

The square was unusually small, measuring only about 220 feet on a side. At the main entrance, on one side of the square, was a bastion containing two cannon. Constructed in stone laid up against the compound walls, some of the Indian quarters had flat roofs, while others had pitched roofs of thatch. In 1780 several *jacales*, structures erected of vertical poles, still stood.

The fields of Espada covered about 30 acres and were planted in corn, beans, and cotton. There was a large peach orchard. A small plot was used to grow a variety of reed or grass used for thatching and for weaving in the mission shop.

Associated Resources:

The general appearance of the missions and their immediate environs during the years of their greatest development included lands between the missions which were crossed by the San Antonio River. Paralleling the river on both sides was a series of wide ditches, or acequias, which supplied the water to the irrigation system within each cultivated area. Much of the land along the river and these acequias remained in its natural state during this time. The missionaries had built dams at various points on the river, and from the ponds, which formed behind these dams, water flowed down the acequia system. At points along the acequia line, intermittent tributaries of the river were crossed. The most impressive of these tributary crossings was an aqueduct built across Piedras Creek to carry the water of the acequia over a deep limestone ravine which would otherwise have effectively blocked the construction of the irrigation system in this area.

Just outside the south wall of Mission Concepción was a quarry which supplied the stone for most of the construction at that mission and for a large part of the building carried out at San José.

Linking the missions and the presidio and town was a network of roads, many of which are still in use today. The town itself occupied an area consisting roughly of the central ten blocks of present San Antonio. Mission Concepción at this time was more than two miles from the town, and the other missions were progressively farther from the urban areas of San Antonio.

At greater distances, outside the district, were the ranches of the missions. Here were raised large numbers of livestock; the cattle, sheep, goats, horses and mules necessary to support the mission system.

Appendix D contains a complete listing of historic structures as recorded in the List of Classified Structures (LCS). The LCS for those structures at Rancho de las Cabras requires inputting.

4. CULTURAL ARTIFACTS / MUSEUM COLLECTION

The park's artifact collection is largely comprised of archeological material recovered from sites within the park. Recently, due to a critical space shortage, the park's onsite artifact collection storage was consolidated and downsized, with long-term loan items returned to the State of Texas and the Archdiocese of San Antonio. These items comprised about one-third of the entire collection. Another one-third of the cataloged collection was packed and moved to the University of Texas at San Antonio (UTSA) for storage. The remaining one-third, is comprised of nine boxes of cataloged artifacts and eleven boxes of accessioned items.

Twenty-eight items from the collection are currently on exhibit in the visitor center museum and elsewhere in the park. Some 430 nitrate negatives that had been a part of the park's photographic archive have been copied as 4 x 5 prints and safety negatives. The nitrate negatives were subsequently sent to the Western Archeological and Conservation Center (WACC) for permanent storage.

Eighty-seven accessions are either partially cataloged or in need of cataloging, totaling approximately 18,000 items. The collection, including those on exhibit, are in good condition.

The park has acquired some items, mostly donated photographic images, and a number of artifacts on loan for exhibit at the visitor center at Mission San José and at Mission Espada.

Appendix E contains a current summary of the park's museum collection ("Collections Management Report").

III. RESOURCE THREATS

A. NATURAL RESOURCES

1. LACK OF BASIC RESOURCE AND MONITORING DATA

The issues and threats that face the park are dynamic and extremely complex because of the park's urban setting and the resulting developmental stresses that are placed on it. There is insufficient data and knowledge regarding park ecosystems and threats to them because of this, which further complicates management of natural resources.

Additionally, natural resource inventories (plants, animals, insects) are either outdated or are lacking. . Scientific inventories of plant or vertebrate species, that may reveal the presence of T+E species, are currently lacking or are old. For example, a plant survey

was done in 1980 for what is now half the current park acreage. A bird survey was done in 1987 for what is now half the current park acreage. Obviously, to make informed management decisions, identifying and monitoring potential rare species is critical.

Hence, this lack of data represents a threat of its own. It renders it difficult for park management to make well-informed and timely decisions on projects without knowing if these projects may negatively impact a facet of the park's natural resources.

Once baseline data sets are gathered, it is essential that monitoring programs are established that can detect trends in the resource. This in turn will aid in creating future management strategies.

2. ADJACENT LAND USES

Increasing development on adjacent and surrounding lands, i.e., Stinson Airport, AGE Refinery, roads and highways, railroads, subdivisions and associated developments, water demands, and visual intrusions to the cultural and natural setting all result in direct and indirect impacts to the park's resources.

3. SURFACE WATER THREATS

Human-caused alterations (flood control projects) to the San Antonio River and uncertain or unattainable water rights for the associated Acequias (irrigation ditches) affect the parks water resources. Due to jurisdictional priorities the park does not always have control over many of these factors that effect surface water quality.

4. NON-NATIVE SPECIES INVASION

Non-native plant and accompanying human development/occupation have invaded the park with varying degrees of impact to native fauna and flora. Exotic vegetation has the potential to choke the historic acequias, crowd out native riparian vegetation, and displace native forbs and grasses in fields.

A variety of exotic floral and fauna species have been documented in the park. These include: trees such as Chinaberry (*Melia azedarach*) and Wax-leaf Privet (*Ligustrum quihoui*); reeds such as Giant Reed (*Arundo donax*); grasses such as Bermuda Grass (*Cynodon dactylon*) and Johnsongrass (*Sorghum halapense*); insects such as Red Imported Fire Ants (*Solenopsis invicta*) and Africanized Honey Bees (*Apis mellifera scutellata*); birds such as Rock Doves (*Columba livia*), European Starlings, and House Sparrows; freshwater clams such as Asian Clam (*Corbicula fluminea*); fish such as Blue Tilapia (*Tilapia aurea*), and feral cats and dogs. Management concerns related to many of these exotic species are addressed in the park's Integrated Pest Management (IPM).

5. WATER POLLUTION

The park's urban setting and the resulting pollution contribute many factors, which results in the deterioration of water quality. The park cooperatively interfaces with several local, state and federal entities such as Edwards Aquifer Authority, San Antonio River Authority (SARA), San Antonio Water System (SAWS), Texas Natural Resources and Conservation Commission (TNRCC), City of San Antonio to name a few. Because of the scope and number of other agencies involved with the San Antonio River, the issue of water pollution is a complex and dynamic challenge that the park faces.

6. AIR POLLUTION

The impact of air pollution on the park's more fragile cultural and natural resources such as mission structures, masonry, flora and fauna has not been determined. An increase in acid rainfall could greatly accelerate the deterioration of the sandstone and limestone rocks and of the cementing agents used in the construction of the missions and related structures as well as plant and animal life in the park. An increase in air pollution could also decrease the integrity and bio-diversity of the historic scene at the mission sites.

7. NOISE POLLUTION

As cited in the preceding section "Land Use and Trends", the City of San Antonio owns and operates Stinson Airport, which is just west of Mission San Juan. The airport serves as a reliever for San Antonio International Airport, accommodating small-to-mid size propeller and jet -powered aircraft. Overflight issues affect both Missions Espada and San Juan. The main concern is that these jets are now routinely fly directly over Missions Espada and San Juan affecting the "sound" heritage as these two sites. The city is also proposing new facilities and increased usage of Stinson Airport that could have adverse impacts on the park.

B. CULTURAL RESOURCES

1. VISITATION

The park receives in excess of 1.3 million visitors per year. This impact is manifested in the following ways:

- a)** soil compaction and damage to surface resources from foot traffic. Unchecked compaction could impact subsurface resources as well.
- b)** increased erosion due to foot traffic causes reduced vegetation. Unchecked erosion could impact subsurface resources as well.
- c)** physical damage to historic resources caused by foot traffic and handling of resources. Unchecked this could result in structural damage.
- d)** heavy densities of large groups of visitors has the potential to increase the relative humidity in the interior or historic structures. Of particular concern are those resources containing the last remnants of Spanish colonial fresco paintings.
- e)** increased visitation causes external structural deterioration as a result of increased vehicular traffic. Additional impacts include air and noise pollution.

- f) increased visitation results in increased infrastructure, which then results in the potential for increased ground and structure impacts.
- g) increased and/or unsupervised handling of artifacts has a deleterious effect on the parks' museum collection.

2. ENVIRONMENTAL

Environmental impacts include:

- a) weather: freeze-thaw cycles could damage historic surface and subsurface masonry structures; flooding can erode foundation and footings causing wall failures; drought can cause movement of foundations resulting in structural damage; exposure to the sun causes ultraviolet degradation of delicate plasters and fresco paints; wind has the potential to damage structures from falling trees, limbs, roots pushing on foundations. Moisture migration up through historic masonry structures results in "rising damp" which over time has a very deleterious effect on these structures.
- b) pests: physical damage may result may result from termites, carpenter ants, mason bees, honey bees, mud daubers, rodents, etc.
- c) vegetation: small plants embed in masonry structures resulting in weakened masonry; tree roots may lift foundations; tree limbs growing too close to structures can undermine a structure.

3. MAINTENANCE

- a) Improper and/or deferred maintenance can contribute to the degradation to historic resources.
- b) The maintenance of a park's infrastructure can accelerate damage to historic resources.
- c) Adaptive renovation of historic structures for modern use could be a threat to the historic integrity of historic resources.
- d) Dealing with improper or inadequate previous designs or construction techniques (including those which are historic of their own right), can cause major problems for the continued preservation of historic structures.

4. VANDALISM

- a) Being in a large urban area, the park is exposed to graffiti and other forms of physical damage to historic structures. The challenge is in both protecting these resources and repairing the damage without causing further or more accelerated damage.
- b) Break-ins has been another challenge to the park.

5. OTHER THREATS

- a) Overflights: Air traffic from Stinson Airport contributes to vibration damage, noise pollution, and air pollution.
- b) Park industrial neighbors such as the AGE Refinery and Air Force bases contribute groundwater and air pollution.

- c) Continued development of the urban areas surrounding or immediately adjacent to the National Historical Park.
- d) The passage of time in and of itself can have a cumulative effect to historic fabric.

V. NATURAL RESOURCE MANAGEMENT PROGRAM

Currently the management of natural and cultural resources is divided between the divisions of Resource Management and Visitor Protection (RM&VP) and the park's Professional Services Division (PSD). PSD is responsible for cultural resources including cultural landscapes, and RM&VP, for natural resources and visitor protection. There is an obvious overlap of responsibilities but both divisions work well cooperatively to achieve their respective goals.

A. STAFFING AND SKILLS

The RM&VP division consists of five permanent rangers GS-0025 and one biologist (GS-0401). They are 1.) One GS-12 Chief Ranger who oversees resource management and visitor protection, and also performs law enforcement duties. 2) One GS-11 Biologist who is responsible for the majority of the development and coordination of natural resource projects along with biological research and documentation writing. 3.) Three GS-9 park rangers who are responsible for the park's fire management program, health and safety program, exotic vegetation management program, haz-mat and recycling program, emergency response program, and physical security program, among other responsibilities. Additionally they are commissioned to perform law enforcement duties. 4.) One GS-9 park ranger who is responsible for the park's Special Park Use Permit program Concessions Management program and GIS program as well as other resource management related activities. This is not a commissioned position.

B. PRESENT MANAGEMENT AND FUTURE NEEDS

1. PROGRAM ADMINISTRATION AND MANAGEMENT

Resource issues are very intricate and dynamic because of the park's urban setting and the stresses and developmental pressures that are brought to bear on the park's environs. There is a Chief of RM&VP, and of necessity, most of the chief's duties are devoted to visitor and resource protection. Although there is a biologist on staff, having biotechnicians in the field devoted to natural resource interests is essential. There are many IPM issues at the park, and presently, are managed by a coordinator in the Division of Interpretation. However, due to the large workload, it is possible that the biologist will assist in this area.

Filling three GS-5/7 Biotechnicians, and seasonal employees (or interns) as needed are unfunded needs. The three GS-5/7 biotechnicians could work as follows: one working in plant inventory and monitoring and exotic vegetation control, one working in animal inventory and monitoring and water quality testing, and one working as a GIS database manager and helping the others as needed. Seasonal/interns may assist in summer months.

2. NEPA COORDINATION

All projects will be reviewed by a team of park specialists (Interdisciplinary Team, or IDT) to determine what effects a project may have on natural and cultural resources. Each specialist will address his/her particular discipline. For example, natural resource interests will be addressed by the biologist. Projects will be reviewed as to their impact on federal and state listed species. An Environmental Screening Form (ESF) will be filled out by the person heading the project and distributed to the NEPA Coordinator and the members of the IDT. It will indicate whether a project warrants a Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement. To aid in the compliance process, the project will be reviewed by the biologist for all flora or fauna species listed as Endangered, Threatened, Species of Concern, Candidate, or Rare by the Federal Government, or the State of Texas, that have the potential to be within the park. Adequate project mitigation measures will be taken, as determined by each Park's specialist of a particular resource. In some instances, cancellation of a project may occur to ensure the protection of a particular resource. A protocol for the ESF process is found in the document entitled SAAN NEPA Environmental Screening Form.

3. FIRE PROTECTION

Most of San Antonio Missions National Historical Park is within the city limits of San Antonio. Since the park's inception, there have been few uncontrolled fires in the park. However, because many park acres abut private residences and some commercial structures, there is a need to consider this urban interface as it relates to fire protection. A fire plan has been written for the park. It is being updated this year to suggest possible mechanical or prescribed burn treatments to effectively deal with the potential problem.

The park will coordinate with the local fire department in regards to any type of fire within the park (uncontrolled fire, prescribed burn).

4. VEGETATION MANAGEMENT

a) General Vegetation Management

Routine maintenance at the park includes vegetation trimming and removal. Individual park resident plants that are not federal or state listed as Endangered or Threatened will be removed if they pose a danger to visitors, threaten park resources, or become a nuisance in areas surrounding a park.

With the reintroduction of water to the historic San Juan Acequia, and plans for the development of a demonstration farm at Mission San Juan, there will be increased challenges in managing vegetation. The park is also acquiring new land, and this will increase the need to inventory and monitor plant species (particularly rare plants), to control the exotic component, and to increase the native plant component.

b) Inventorying and Monitoring of Flora

With the park nearly doubling in size since the last plant survey, an up to date presence/absence plant survey is essential to ensure responsible management decisions. This type of scientific survey provides valuable information regarding existence and general habitat location of rare plants in the park. The data helps

guide project decision-making and potential mitigation activities. By acquiring this data set, the Park will meet its goal of compliance with the National Park Service's Inventory and Monitoring plan. Under the plan, park's must have a presence/absence list of 90% of plant species (and all vertebrate taxa) found in the park by 2003.

San Antonio Missions NHP is part of the Gulf Coast Network, a group of National Parks in the south southeast charged to create a study plan. After meeting in the summer of 2000, the network chose plants and herps to be inventoried first. An effort will be made to obtain divide areas of the park up by general habitat type in an effort to make presence/absence data more useful (transferring data to a GIS layer). The network is presently in the process of offering contracts to various individuals or groups to conduct surveys in the parks using nationally allocated Inventory and Monitoring funding.

c) Exotic Species Removal Program

The park will restore noncontroversial native species into suitable habitats within their historic range, and take steps to control exotic species.

Exotic vegetation in the park ranges from historically planted annual grasses that have outcompeted perennial grasses to shrubs and trees that have escaped from historical gardens. Management has recently focussed on three aggressive exotic species that are negatively impacting native plants by displacing them from habitat. These are Chinaberry, Privet (*Legustrum*), and Giant Reed.

The park is currently working on reducing the amount of Chinaberry and Privet. An environmental assessment has been written and funding has been provided for this fiscal year; additional funding will be needed to complete this project as well as funding for the Giant Reed. As the park prepares for an agricultural demonstration farm at Mission San Juan in the next few years, other exotics (particularly forbs and grasses) will also be addressed and will need funding. Funding has recently been provided to hire three fulltime employees to maintain the historic acequias.

d) Controlled Burning/Mechanical Manipulation Program

San Antonio Missions National Historical Park is a National Park with an urban interface, and fuels reduction should always be considered in natural resource planning. Because of the dense, complex vertical structure connecting many of the vegetation types to the urban interface mosaic, prescribed burning would not be as prudent for reducing fuel as mechanical manipulation. Historically, vegetation in fallow fields, consisting of high weeds and small brush, has been controlled through routine mechanical manipulation in the form of disking. Conversely, complex, vertical structured riparian areas adjacent to the Espada and San Juan acequia systems, have not been manipulated save for the yearly clearings of the acequia itself by the ditchmaster.

Several large pockets of South Texas Plains vegetation type communities (e.g. mesquite, huisache) are found along the San Antonio Mission Trail and the Espada Acequia, and mechanical manipulation of these areas may be beneficial to reduce the possibility of wildfire impacting the urban interface. Park property at Rancho de Las Cabras, because of its locale, does not have urban interface issues, and hence, does not require prescribed burning from a safety perspective.

5. WILDLIFE MANAGEMENT

a) Inventorying and Monitoring of Vertebrates

Many data sets in the park are out of date or non existent. In order to successfully manage projects, information must be accurate and as up-to date as possible. By acquiring these data sets, the Park will meet its goal of compliance with the National Park Service's Inventory and Monitoring plan. Under the plan, all parks must have a presence/absence list of 90% of the herps, mammals, birds, and fish (and plants – see Vegetation Management) found in the park by 2003. San Antonio Missions NHP is part of the Gulf Coast Network, a group of National Parks in the south, south east charged to create a study plan toward this purpose. After meeting in the summer of 2000, the network chose plants and herps to be inventoried first. The network is presently in the process of offering contracts to various individuals or groups conduct surveys in the parks using nationally allocated Inventory and Monitoring funding. It is unknown whether sufficient funding will be available from this source in order to conduct surveys all vertebrates. Additional funding will most likely be needed to accomplish the goal.

b) Maintain an Integrated Pest Management Program

An integrated pest management (IPM) plan has been adopted. Fire ants, termites and Africanized honey bees are the main pests managed at the park. Both fire ants and termites are controlled with pesticides. Routine checks of culverts and other structures must be conducted help identify and control potential Africanized bee colonies. Exotic vegetation has been addressed in the IPM plan. However, with the reintroduction of water to the San Juan Acequia, new IPM issues may unfold, requiring an amendment to the plan that addresses exotic vegetation management more extensively.

6. WATER RESOURCE MANAGEMENT

Numerous challenges exist in managing water quality. A nearby military base has polluted some local water resources. Also, the San Antonio River Authority (SARA) manages the San Antonio River. The park is committed to improving the health of watercourses adjacent to park property. Toward this end, the park has dialogued with the San Antonio River Authority to acquire water monitoring results and to offer assistance toward improving water resources. There is a possibility that the park can acquire a water monitoring test kit which has the potential to detect the presence of contaminants in the acequia systems.

7. INFORMATION MANAGEMENT

a) Natural Resource Bibliography

Computer files have been developed of all natural resource papers addressing the San Antonio Missions National Historical Park. While the park's library is well represented from a cultural resource perspective, there is a need for a more comprehensive natural resource library.

b) Comprehensive Photographic Documentation

While the Park obtained winter aerial photos, summer aerial photos are needed to help interpret and manage vegetation.

c) Natural Resource Data Sets

The park is currently working on securing a number of data sets with the goal of at least two data per year. These data sets are: Vegetation Map (digital), Plants, Herps, Mammals, Birds, Fish, Insects, Historical (Bibliography), Meteorological and Precipitation, Geology Map (digital), Water Resource Inventory, Soil Map (digital), Air Quality, Water Chemistry, Visibility. Vegetation maps and meteorological /precipitation data have been recently updated (1999).

d) Geographical Information System

The park has initiated setting up a (GIS) program that will assist in the management of data collected for both natural and cultural resources. The program will incorporate GIS and Global Positioning System (GPS) technologies to assist park management in making well informed and timely decisions regarding the management of the park's natural resources as well as other phases in park operations and maintenance.

Funding will be sought for a seasonal or part-time GIS technician, or a full time GS 5/7 computer specialist who can assist the biotechnicians at certain times.

8. HUMAN USE AND IMPACT MANAGEMENT

a) Coordinate with adjacent land owners to protect resources.

1) Habitat: An important part of managing potential habitat for possible federal or state endangered or threatened species involves determining the habitat types existing on adjacent lands, and identifying the potential upcoming projects on those lands. In situations where adjacent acreage has desirable habitat contiguous with similar habitat within the park, this information maybe worthwhile to develop possible conservation measures that include dialogues with adjacent land holders to protect/enhance that type of habitat

A city organization, San Antonio Parks and Recreation (SAPR), owns land adjacent to the park. Dialogues have been initiated between the park and SAPR regarding the possibility of working cooperatively toward exotic vegetation removal, native restoration, and acequia upkeep.

2) Environmental Cleanup: The park has initiated dialogue with nearby Brooks Air Force base in regard to a trichlorethene plume that has spread to subterranean groundwater beneath current land holdings adjacent to the historic San Juan Acequia. This land is being sought for purchase by the park. Park representatives have attended Brooks Air Force public addressing the clean-up project, and have expressed concerns. Good relations have been developed between the two agencies, and NPS land acquisition in the area (land where the San Juan Acequia borders) is moving forward, pending cleanup of the sites.

3) Noise: Nearby Stinson Airport has proposed expansion of its runways to allow jets, and the subsequent increased noise would be in conflict with aesthetic values that the historical park is attempting to enhance. Dialogues with the local airbase about the park's position and possible mitigation measures are underway in order to limit potential noise problems.

4) Water: The surface waters of the San Antonio River abut a majority of the park's acreage. The San Antonio River is managed by the San Antonio River Authority (SARA). An ongoing goal of the park is to work with SARA in an effort to improve the health of the river. The park also dialogues with the San Antonio Water System (SAWS) and the Water Resource Division of the United States Geological Survey (USGS).

5) Air: In an effort to be good stewards of air resources, San Antonio Missions National Historical Park encourages practicing Bexar County Air Alert suggestions on specific days when there is potential for heavy air pollution in the San Antonio area. Along with the city, county, and the Alamo Area Council of Government, the park has agreed to a series of action measures to reduce the creation of ozone: (1) Give incentives to those employees who use buses for their daily commute to work; (2) Encourage employees to use general energy conservation measures; (3) Maintain fleet vehicles according to the manufacturer's tune-up and emissions control standards; (4) Consider alternative fuel vehicles; (5) Refuel fleet vehicles carefully and in the cooler evening hours during Air Quality Health Alert (AQHA) days; (6) Avoid mowing lawns or using gas-powered lawn equipment during AQHA days; (7) Limit use of oil-based paints, varnishes, and degreasers to non AQHA days; (8) Encourage employees to bring lunch to work or walk to avoid car travel during lunchtime; and (9) Practice efficient driving.

b) Coordinate with Partner Organizations and Like-Minded Organizations to Protect/Manage Resources

1) San Antonio Missions National Historical Park interacts integrally with two partner organizations, Los Compadres and the Catholic churches. Los Compadres is an organization made up of individuals with a great love for

the San Antonio Missions, and who contribute time and funds to various projects. The National Park Service maintains an excellent relationship with Los Compadres, and there have been resource projects that have been funded exclusively by the organization. For example, the rehabilitation of the upcoming environmental education center, the Harris House, was partially funded by Los Compadres.

2) San Antonio Missions National Historical Park also has an integral relationship with the active Catholic churches at each of the mission sites. The churches oversee the preservation and maintenance of the churches' interior, and the Park oversees the preservation and maintenance of the exterior and the grounds of the mission sites.

3) The San Antonio Missions National Historical Park also works closely with numerous non-partner agencies and organizations to better protect Park resources. They include: Stinson Airport, San Antonio River Authority, Brooks Environmental Division, United States Geological Survey - Water Resource Division, San Antonio Water Systems, Texas Natural Resource Conservation Commission, Texas Parks and Wildlife (San Antonio) - Urban Biology, Texas Parks and Wildlife (Austin) - Natural Diversity, United States Fish and Wildlife Service (Austin), San Antonio South Side Chamber of Commerce, Ditchmasters of Espada Acequia, the San Antonio Conservation Society., and the Texas Historical Commission (THC).

C. UNFUNDED NATURAL RESOURCE MANAGEMENT NEEDS

The following project statements are unfunded natural resource management needs (see Appendix B):

1. Management of Natural Resources
2. Identification of Flora and Fauna
3. Control of Exotic Plant Species
4. Information Storage and Manipulation (GIS)
5. Conduct Water Quality Monitoring

VI. CULTURAL RESOURCE MANAGEMENT PROGRAM

Cultural resource management involves *research*, to identify, evaluate, document, register, and establish other basic information about cultural resources; *planning*, to ensure that this information is well integrated into management processes for making decisions and setting priorities; and *stewardship*, under which planning decisions are carried out and resources are preserved, protected, and interpreted to the public.³

³ U.S. Department of the Interior, National Park Service, Director's Order #28 (D.O.-28), *Cultural Resource Management Guideline*, 1997. 1.

A. STAFFING AND SKILLS

The Professional Services Division consists of four permanent professional staff, including a GS-11/12 Historical Architect (vacant), GS-11 Landscape Architect, GS-12 Historian, and GS-11 Archeologist. The Division is responsible for planning, design, research, and compliance with both Section 106 of the National Historic Preservation Act and The National Environmental Policy Act (NEPA). The historian's responsibilities include oversight and management of the park's museum collection and paper archives. The division chief works closely with the maintenance division on historic preservation needs and requirements.

B. PRESENT MANAGEMENT AND FUTURE NEEDS

1. Program Administration and Management

Cultural resources management issues at San Antonio Missions National Historical Park echo those of the natural resource program due primarily to the park's urban setting and related developmental, geographic, and demographic issues. The Chief of Professional Services historically manages the program with close ties to his/her staff and the maintenance division. Compliance with Section 106 of the National Historic Preservation Act, and with NEPA, requires a broad base of knowledge and experience. Similarly, knowledge of the myriad other preservation laws and regulations is paramount. San Antonio is fortunate to have a very active local preservation organization—the San Antonio Conservation Society. As well, the City maintains a proactive Historic Preservation Office; and a close working relationship with the Texas State Historic Preservation Officer (the Texas Historical Commission, or THC) completes the cooperative spirit within which the program functions.

Volunteers have historically filled a very important function within the division. Curatorial activities and technician skills, such as drafting, are important assets which volunteers bring to the division.

2. Compliance with Section 106 of the National Historic Preservation Act

Section 106 mandates that federal agencies take into account the effects of their actions on properties listed or eligible for listing in the National Register and give the Advisory Council on Historic Preservation a reasonable opportunity to comment. While it does not require the preservation of such properties, it does require that their historic or prehistoric values be considered in weighing the benefits and costs of federal undertakings to determine what is in the public interest. Its practical effect is to encourage agencies to seek ways to avoid or minimize damage to cultural resources. Agencies must recognize properties important to communities as well as to the nation as a whole, so they need to be aware of the interests of local groups and individuals. The goal of the process is to make sure that preservation is fully

considered in federal actions, thereby protecting our shared heritage from thoughtless or ill-considered damage.⁴

Activities related to 106 compliance are crucial to the management of the park's cultural resources.

3. Research

According to the NPS *Management Policies*, "The National Park Service will conduct a coordinated program of basic and applied research to support planning for and management of park cultural resources." Such mission-related research can identify and evaluate historic properties, advance knowledge of ethnographic resources and their importance to Native Americans, provide background data on park issues, contribute to interpretive programs, help avoid adverse impacts, and develop technologies for treating, monitoring, and protecting cultural resources. Research will be accomplished with the participation and review of professionals in all disciplines concerned with its subject.⁵

Research needs related to the cultural resources management at San Antonio Missions NHP are delineated in Appendix F.

4. Planning

The goal of cultural resource planning in the national park system is to identify and preserve park cultural resources and provide for their appreciation by the public. It strives to integrate cultural resource concerns into broader NPS planning processes, to avoid or minimize harm to cultural resources, to identify the most appropriate uses for cultural resources, and to determine the ultimate treatment (preservation, rehabilitation, restoration, reconstruction/reproduction) or deliberate neglect or destruction for cultural resources.⁶

All planning activities fall under the Professional Services Division.

5. Management of Archeological Resources

Archeological resources occur in virtually every unit of the national park system. They are critical to understanding and interpreting American prehistory and history. They include prehistoric and historic period sites, materials found in museum collections, and the records associated with these sites and materials. They are often fragile and may be easily destroyed unless proper attention is paid to their management.

The management of archeological resources on park lands is mandated by law and policy. Of particular importance are the laws and regulations that specifically apply to the National Park Service, the NPS *Management Policies*, the Antiquities Act of 1906, Sections 106 and 110 of the National Historic Preservation Act, the

⁴ D.O.-28. 53

⁵ D.O.-28. 17

⁶ D.O.-28. 31-32

Archeological and Historic Preservation Act, the Archaeological Resources Protection Act, the Abandoned Shipwreck Act, the Native American Graves Protection and Repatriation Act, and their respective implementing regulations, standards, and guidelines. A brief overview of these acts and other applicable laws and regulations can be found in Appendix B of Director's Order-28.

The Professional Services Division's full time archeologist is responsible for this program. Research needs of the program are identified in Appendix F and specific projects in Appendix G (summary list of cultural project statements).

6. Management of Historic and Prehistoric Structures

According to both federal law and NPS *Management Policies*, all historic structures in which the Service has a legal interest are to be managed as cultural resources. Regardless of type, level of significance, or current function, every structure is to receive full consideration for its historical values whenever a decision is made that might affect its integrity. Historic structures that are central to the legislated purposes of parks, especially those that are to be interpreted, may be subjects of additional, specialized efforts appropriate to their functions and significance.

The preservation of historic structures involves two basic concerns: slowing the rate at which historic material is lost, and maintaining historic character. Research on, planning for, and stewardship of historic structures focus on these concerns. Research defines historical associations, integrity, character, and the causes of material deterioration; planning develops and evaluates proposals for use and treatment in terms of their likely effects; and stewardship entails activities ranging from craft training to the identification and mitigation of threats.

Preservation of historic structures is an interdisciplinary effort requiring cooperation and communication among historical architects, architectural conservators, preservation specialists, archeologists, landscape architects, historians, ethnographers, and curators.⁷

This facet of cultural resources management at San Antonio Missions NHP is perhaps the most involved primarily because of the need to provide a safe and visually pleasing atmosphere for the park's visitors and staff. Again, the park is fortunate to have a cadre of professionals who, working closely with the maintenance staff, work to achieve this goal.

Appendix G, the summary list of current project statements, and Appendix I, the list of current projects in the Project Management Information System (PMIS) related to cultural resources management delineate the current needs. The individual project statements for cultural projects are in Appendix H.

⁷ D.O.-28. 113

7. Management of Museum Objects and Park Archives

Museum collections (objects, specimens, and archival and manuscript collections) are important park resources in their own right as well as being valuable for the information they provide about processes, events, and interactions among people and the environment. Natural and cultural objects and their associated records provide baseline data, serving as scientific and historical documentation of the park's resources and purpose. All resource management records that are directly associated with museum objects are managed as museum property. These and other resource management records are preserved as part of the archival and manuscript collection because they document and provide an information base for the continuing management of the park's resources. Museum objects used in exhibits, furnished historic structures, and other interpretive programs help visitors gain better understanding of the events, activities, and people commemorated by parks.⁸

Museum archival and manuscript collections (non-official records) include all types of documentary records that contribute substantially to the understanding, interpretation, and management of other park resources (cultural and natural) as well as being important resources in their own right. These non-official records are managed as part of the museum collection. These collections are arranged and described according to the standards stated in the *Museum Handbook*, Part II, Museum Records, Appendix D.⁹

The Park Historian manages both the museum collection, and archival/manuscript collections. Unfunded needs for the Backlog Cataloging and Museum Collections Preservation and Protection Programs are listed in Appendix I.

8. Management of Ethnographic Resources

Ethnography, part of cultural anthropology, is concerned with the peoples associated with parks, with their cultural systems or ways of life, and with the related technology, sites, structures, other material features, and natural resources. In addition to traditional regimes for resource use, for example, and family and community economic and social features, cultural systems include expressive elements that celebrate or record significant events and may carry considerable symbolic and emotional weight. These include rituals, sacred narratives such as origin myths, verbal arts including folk tales, and performing and graphic arts. Cultural anthropologists refer to behavioral, value, and expressive patterns, and technology, as features of cultural systems. Preservation specialists may use the term “intangible” to refer to behavior, values, and expressive culture.

Developing programs, policies, guidelines, and data to help management identify and protect culturally significant resources falls to the applied ethnography program. A major goal is to facilitate collaborative relationships between the NPS and the peoples whose customary ways of life affect, and are affected by, park resource management. Seeking practical outcomes, the program identifies issues that concern

⁸ D.O.-28. 137

⁹ D.O.-28. 141

management, communities, and the resources they both value and provides information to promote mutually acceptable solutions. It cooperates with other programs and with the publics associated with parks to help reduce tensions and close gaps between NPS and community goals.¹⁰

¹⁰ D.O.-28. 157

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