



Amistad National Recreation Area

Draft General Management Plan/Environmental Assessment



Draft
General Management Plan / Environmental Assessment
AMISTAD NATIONAL RECREATION AREA

Val Verde County, Texas
July 2006

Amistad National Recreation Area was authorized by an act of Congress on November 28, 1990 (Public Law 101-628). The last comprehensive management plan for the national recreation area was completed by the National Park Service, Denver Service Center, in 1987, three years before the area was designated a unit of the national park system. That plan does not reflect the current legislative mandate. Amistad National Recreation Area needs a new general management plan based on its enabling legislation. In addition, conditions in the national recreation area have changed substantially since the current plan was approved. Recreational use, including participation in fishing tournaments, has greatly increased. These changes have implications for how visitors access and use the national recreation area and the facilities needed to support those uses, how resources are managed, and how the National Park Service manages its operations.

This document presents two alternatives for managing Amistad National Recreation Area for the next 15 to 20 years. It also analyzes the impacts of implementing each of the alternatives. The “**no-action**” alternative, **alternative A**, consists of the existing national recreation area management and trends and serves as a basis for comparison in evaluating the other alternative. The concept for management under **alternative B** would be to focus on Amistad’s potential as the premier outdoor recreational and educational facility in south-

west Texas. Alternative B is the alternative preferred by the National Park Service. The key effects of implementing the no-action alternative (A) would be some minor adverse impacts on archeological resources, wildlife habitat, transportation, and visitor access. The key effects of implementing alternative B would be minor beneficial effects on transportation and visitor access, minor to moderate beneficial effects on the visitor experience and the socioeconomic environment, and moderate to major beneficial effects on NPS operations.

This *Draft General Management Plan / Environmental Assessment* has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 60 days after the Environmental Protection Agency’s notice of availability has been published in the *Federal Register*. Readers are encouraged to send written comments about this draft plan to Tom Thomas, Amistad National Recreation Area GMP, National Park Service, Denver Service Center-PSD, P.O. Box 25287, Denver, CO 80225 — or to e-mail comments to Tom_Thomas@nps.gov. You can also call Superintendent Alan Cox at 830-775-7492. Please note that NPS practice is to make comments, including the names and addresses of respondents, available for public review; see “How to Comment on this Plan” discussion for further information.

HOW TO COMMENT ON THIS PLAN

Comments on this plan are welcome and will be accepted during a 30-day review period. Comments/responses to the material in this document may be submitted by any of several methods. Written comments can be mailed to the following address:

Tom Thomas
Amistad National Recreation Area GMP
National Park Service
Denver Service Center — P
P.O. Box 25287
Denver, CO 80225

Comments also can be made on a form on the NPS Planning Environment and Public Comment Web site

(<http://parkplanning.nps.gov/amis>

and then click on *Draft General Management Plan*). If the Web site form is not used, please submit Internet comments as a text file, avoiding the use of special characters or any form of encryption. Name and return address should be included in your Internet message, and, if possible, request a return receipt when sending a message. If there is no confirmation from the system that the Internet message has been received, please contact Tom Thomas at 303-969-2141.

Comments can be hand-delivered at public meetings to be announced in the media following the release of this document. Also, comments can be hand-delivered or mailed to the Amistad National Recreation Area headquarters at the following address:

HCR 3 Box 5J
4121 Veteran's Blvd.
Del Rio, Texas 78840-9350

NPS practice is to make all comments on this document, including the names and addresses of respondents who provide that information, available for public review following the conclusion of the NEPA process. Individuals may request that their name and/or address be withheld from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commentors using the website can make such a request by checking the box "keep my contact information private." The National Park Service will honor such requests to the extent allowable by law, but you should be aware that the National Park Service might still be required to disclose your name and address pursuant to the Freedom of Information Act.

The National Park Service will make all submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

The method for submitting public comments listed above stems from court rulings concerning the release of public comments, and it is included as recommended by the Office of the Solicitor, Department of the Interior.

SUMMARY

Amistad National Recreation Area was authorized by an act of Congress on November 28, 1990 (Public Law [PL] 101-628) to administer all lands and surface waters of Amistad Reservoir, totaling 57,292 acres. Before that time, Amistad was administered under the jurisdiction of the National Park Service (NPS). The 1990 enabling legislation established an acreage ceiling of 58,500 acres. The 2000 *Land Protection Plan* (NPS 2000a) identified priorities for the acquisition of significant cultural resources on 1,208 acres of land that are within the statutory ceiling of 58,500 acres established by Congress.

The previous comprehensive planning effort (general management plan) for Amistad National Recreation Area was completed in 1987. Much has occurred since 1987 and the completion of that plan. Patterns and types of visitor use have changed, lake levels have fluctuated, the adjacent community has grown, and public understanding and appreciation of the national recreation area's cultural and natural resources have increased greatly. Each of these factors has major implications for how visitors access and use the national recreation area, the facilities needed to support those uses, how resources are managed, and how the National Park Service manages its operations. A new plan is needed to do the following:

Clearly define resource conditions and visitor experiences to be achieved in Amistad National Recreation Area.

Provide a framework for NPS managers to use when making decisions about how to best protect NPS resources, provide a diverse range of opportunities for visitor experience, manage visitor use, and determine what kinds of facilities, if any, to develop in the national recreation area.

Ensure that this foundation for decision-making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of the alternative courses of action.

This *Draft General Management Plan / Environmental Assessment* presents two alternatives for the future management of Amistad National Recreation Area, including the National Park Service's preferred alternative. The alternatives, which are based on the national recreation area's purpose, significance, and special mandates, present different ways to manage resources and visitor use and improve facilities and infrastructure at the national recreation area. The alternatives are the no-action alternative (continue current management) and alternative B, the preferred alternative.

Additional actions and alternatives were considered. However, these actions and alternatives were dismissed from further analysis. These dismissed actions and alternatives are mentioned, along with the rationale for dismissing them from analysis, in chapter 2, "Alternatives, Including the Preferred Alternative."

ALTERNATIVE A: THE NO-ACTION ALTERNATIVE (CONTINUE CURRENT MANAGEMENT)

The no-action alternative consists of a continuation of the existing management and trends at Amistad National Recreation Area. It provides a baseline for comparison in evaluating the changes and impacts of the other alternative. The National Park Service would continue to manage the national recreation area as it is currently being managed. Existing operations and visitor facilities would remain

SUMMARY

in place. No new construction would be authorized. Efforts would continue to protect and preserve significant cultural and natural resources. Natural ecological processes would be allowed to occur, and restoration programs would be initiated where necessary.

The important impacts of continuing existing management conditions and trends would include potential adverse impacts on the visitor experience, visitor access, transportation, and archeological resources.

ALTERNATIVE B

The concept for management under alternative B, the preferred alternative, would be to build upon Amistad National Recreation Area's distinctive combination of cultural and natural resources and its variety of outstanding water- and land-based recreational opportunities to create a unique recreational and educational opportunity in southwest Texas.

Under this alternative, the national recreation area would be used as an outdoor classroom and resource-based educational opportunities would be expanded to give visitors a deeper appreciation for the history, cultures, and natural environment of the Lower Pecos River valley and the Rio Grande borderlands.

Amistad offers the most diverse array of water-based and land-based recreational opportunities in the American southwest, including fishing, boating, waterskiing, houseboating, scuba diving, hunting, hiking, camping, horseback riding, wildlife observation, and other activities. Opportunities for all these activities would be expanded under this alternative.

Additions and improvements would be made to Amistad's existing infrastructure to enable managers and staff to enhance security, meet NPS commitments to homeland security, pro-

vide for better resource protection, and expand visitor education and interpretation. These improvements would include the construction of a new headquarters facility, a visitor center, and a maintenance facility.

Under both alternatives A and B, NPS management policies require superintendents to manage law enforcement activities as part of a comprehensive, interdisciplinary effort to protect resources, manage public use, and promote public safety and appropriate enjoyment. Cooperation with other law enforcement agencies is important in all units of the national park system, but it is critical at Amistad National Recreation Area and other border units. In the wake of September 11, 2001, security requirements for U.S. borders place additional burdens on the national recreation area's rangers and other staff. Amistad National Recreation Area will cooperate with the various bureaus of the Department of Homeland Security to support and assist those agencies in ensuring the security of the United States.

The important effects of implementing alternative B would include potentially beneficial effects on the visitor experience, visitor access, education and interpretive programs, and cultural and natural resources.

THE NEXT STEPS

After the distribution of the *Draft General Management Plan / Environmental Assessment* there will be a 30-day public review and comment period, after which the NPS planning team will prepare a "Finding of No Significant Impact" and the plan can then be implemented, depending on funding and staffing. (The "Finding of No Significant Impact" does not guarantee funds and staff will be available to implement the approved plan.)

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A GUIDE TO THIS DOCUMENT

This *Draft General Management Plan / Environmental Assessment* is organized in accordance with the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act, NPS *Management Policies 2001*, park planning program standards, and "Conservation Planning, Environmental Impact Analysis, and Decision Making" (DO-12).

Chapter 1: Purpose of and Need for the Plan sets the framework for the entire document. It describes why the plan is being prepared and what needs it must address. It gives guidance for the alternatives that are being considered, which are based on the national recreation area's legislated mission, its purpose, the significance of its resources, special mandates and administrative commitments, servicewide mandates and policies, and other planning efforts in the area.

The chapter also details the planning opportunities and issues that were raised during public scoping meetings and initial planning team efforts (see the box below); the alternatives in the next chapter address these issues and concerns to varying degrees. The first chapter concludes with a statement of the scope of the environmental impact analysis — specifically, what impact topics were or were not analyzed in detail.

Chapter 2: Alternatives, Including the Preferred Alternative, begins by describing the management zones that will be used to manage the national recreation area in the future. It also consists of the continuation of current management and trends in the national recreation area (alternative A, the no-action alternative). Alternative A and alternative B, the preferred alternative, are presented. Mitigating measures proposed to minimize or eliminate the adverse impacts of some proposed actions are described just before the discussion of future studies or implementation plans that will be needed. The

evaluation of the environmentally preferred alternative is followed by tables summarizing the alternative actions and the environmental consequences of implementing those actions. The chapter concludes with a discussion of alternatives or actions that were dismissed from detailed evaluation.

Chapter 3: The Affected Environment describes the areas and resources that would be affected by implementing actions in the various alternatives — cultural resources, natural resources, visitor use and experience, and the socioeconomic environment.

Chapter 4: Environmental Consequences analyzes the impacts on resources described in the "Affected Environment" chapter that would result from implementing the alternatives. Methods used for assessing the impacts (intensity, type, and duration of impacts) are outlined at the beginning of the chapter.

Chapter 5: Consultation and Coordination describes the history of public and agency coordination during the planning effort and any future compliance requirements. It also lists agencies and organizations that will receive copies of the document.

The **appendixes** present supporting information for the document. The back of the document also contains references, a list of the planning team and consultants, and the index.

<p>The primary goal of scoping is to identify issues and determine the range of alternatives to address. During scoping, the NPS staff provides an overview of the proposed project, including purpose, need, and alternatives. The public is asked to submit comments, concerns, and suggestions.</p>
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Purpose of and Need for the Plan



Why We Do General Management Planning

The National Parks and Recreation Act of 1978 requires for each unit of the National Park Service (NPS) to have a general management plan (GMP), and NPS *Management Policies 2001* states “[t]he Service will maintain an up-to-date management plan for each unit of the national park system” (2.3.1, “General Management Planning”). But what is the value, or usefulness, of general management planning?

The purpose of a general management plan is to ensure that a national park system unit has a clearly defined direction for resource preservation and visitor use that will best achieve the National Park Service’s mandate to preserve resources unimpaired for the enjoyment of future generations. In addition, general management planning makes the National Park Service more effective, collaborative, and accountable by

- providing a balance between continuity and adaptability in decision making — Defining the desired conditions to be achieved and maintained in a park unit provides a touchstone that allows NPS managers and staff to constantly adapt their actions to changing situations while staying focused on what is most important about the park unit.
- analyzing the park unit in relation to its surrounding ecosystem, cultural setting, and community — This helps NPS managers and staff understand how the park unit can interrelate with neighbors and others in ways that are ecologically, socially, and economically sustainable. Decisions made within such a larger context are more likely to be successful over time.
- affording everyone who has a stake in decisions affecting a park unit an opportunity to be involved in the planning process and to understand the decisions that are made — National park system units are often the focus of intense public interest. Public involvement throughout the planning process provides focused opportunities for NPS managers and staff to interact with the public and learn about public concerns, expectations, and values. Public involvement also provides opportunities for NPS managers and staff to share information about the park unit’s purpose and significance, as well as opportunities and constraints for the management of park unit lands.

The ultimate outcome of general management planning for national park system units is an agreement among the National Park Service, its partners, and the public on why each area is managed as part of the national park system, what resource conditions and visitor experience should exist there, and how those conditions can best be achieved and maintained over time.

INTRODUCTION

This *Draft General Management Plan / Environmental Assessment* presents and analyzes two alternative future directions for the management and use of Amistad National Recreation Area. Alternative B is the National Park Service's preferred alternative. The potential environmental impacts of both alternatives have been identified and assessed.

General management plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks. General management plans typically provide guidance covering a 15- to 20-year period.

Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities prevent the immediate implementation of many actions. Major or especially costly actions could be implemented ten or more years into the future.

BRIEF DESCRIPTION OF THE NATIONAL RECREATION AREA

Amistad Reservoir, near the city of Del Rio in Val Verde County, Texas, was created under the provisions of the Water Treaty of 1944 between the United States and the Republic of Mexico and Public Law (PL) 86-605 (July 7, 1960), which authorized the joint construction of the international storage dam, to be managed by the International Boundary and Water Commission (IBWC). On November 11, 1965, the IBWC, by Memorandum of Agreement, assigned the administration of all lands and surface waters on the reservoir to the National Park Service to manage recreation. The national recreation area was established as a unit of the national park system on November 28,

1990, under the provisions of PL 101-628 (see appendix A). Congress authorized the national recreation area to provide for public outdoor recreation and enjoyment of the United States portion of Lake Amistad and to protect the scenic, scientific, cultural, and other values contributing to such enjoyment. Amistad National Recreation Area (the national recreation area or Amistad) encompasses 57,292 acres, most of which is the U.S. portion of the reservoir's water surface. The national recreation area's boundary generally is defined as the reservoir surface and shore area up to the 1,144-foot elevation contour above mean sea level, with a pool conservation level of 1,117 feet above mean sea level.

U.S. Highways 90 and 277/377, which pass through the national recreation area, are the primary highway access to the major visitor facilities, boat ramps, and recreation use areas. Local roads, state spur, and state recreational roads connect the two major highways to specific visitor use sites. Largely surrounded by private land, most of Amistad National Recreation Area and its 540 miles of shoreline (on the U.S. side of the border) are accessible to the public only by boat.

Like other border national park system units, Amistad National Recreation Area faces law enforcement challenges related to illegal drug smuggling, illegal immigration, and securing the borders of the United States. Eighty-three miles of the U.S.-Mexico border are within the boundaries of the national recreation area.

Amistad National Recreation Area offers a diverse array of water- and land-based recreational opportunities, including fishing, boating, houseboating, sailing, waterskiing, scuba diving, hunting, camping, hiking, wild-life observation, and horseback riding. The national recreation area, renowned as one of the outstanding bass fishing reservoirs in the United States, hosts more than 150 bass

fishing tournaments annually. Amistad offers waterfowl, upland bird, turkey, and big game hunting on one of the largest tracts of public land available for hunting in southwestern Texas.

Amistad National Recreation Area and the surrounding region are home to one of the most extensive concentrations of rock art and archeological sites in North America. The national recreation area's archeological record spans nearly 12,000 years of human history and prehistory. Within or adjacent to the national recreation area's boundaries are four National Register of Historic Places archeological districts, which collectively list 182 sites at the national level of significance.

With more than 325 known rock art sites in an area of roughly 50 square miles, the Lower Pecos River valley has one of the densest concentrations of archaic rock art in the New World. Some of North America's oldest, largest, and best-preserved rock art sites are within the national recreation area's boundaries. Four major prehistoric styles and one historic period pictograph style are represented in the region.

Amistad National Recreation Area is home to the third largest museum collection in the national park system. The collection includes artifacts from more than 200 sites and 22 major excavations. The collection is estimated to contain more than 1 million artifacts and objects.

Amistad National Recreation Area's lands occupy a transitional zone between three major biotic provinces: the Chihuahuan Desert to the west, the Balconian to the northeast, and the Tamaulipan scrub to the southeast. This zone of convergence, which covers an area of roughly 2,500 square miles, is more or less centered on what once was the confluence of the Pecos River and the Rio Grande.

Amistad is home to a wide variety of mammals, birds, reptiles, amphibians, fish, insects, and other invertebrates, and plants. Among these are game fish such as white bass, striped bass, and large-mouth bass that have earned Amistad its reputation as a premier sport-fishing destination.

The construction of the Amistad Dam and the creation of Lake Amistad fundamentally altered this part of the Rio Grande landscape while creating over time a new and different environment. These and other environmental changes have precipitated the introduction of numerous nonnative animal and plant species. These exotic species consume scarce resources, push out native species, and ultimately substantially alter the environment.

Several threatened or endangered species or species of concern have been confirmed either in or near the vicinity of the reservoir. These include the interior least tern, black tern, snowy plover, hooded oriole, olive sparrow, white-faced ibis, Devils River minnow, the Texas horned lizard, and the cave myotis (bat).

The national recreation area offers a range of educational seminars and interpretive programs for schoolchildren and other visitors.

NPS facilities at Amistad include the visitor information center, campsites, marinas, ranger station, designated swimming beaches, picnic areas, and boat launch ramps. The main boat launch ramps are at Diablo East, Rough Canyon, Box Canyon, 277 N, Blackbrush Point, Pecos River, and the Air Force Marina.

PURPOSE OF THE PLAN

The approved general management plan will be the basic document guiding management of Amistad National Recreation Area for the next 15 to 20 years. The purposes of this plan are as follows:

- Confirm the purpose, significance, and special mandates of Amistad National Recreation Area.
- Clearly define resource conditions and visitor uses and experiences to be achieved in the national recreation area.
- Provide a framework for national recreation area managers to use when making decisions about how best to protect the resources, how to offer quality visitor uses and experiences, how to manage visitor use, and what kinds of facilities, if any, to develop in or near the national recreation area.
- Ensure that this foundation for decision-making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Amistad National Recreation Area (and other units and programs of the national park system). This *General Management Plan* will build on these laws and the legislation that established Amistad National Recreation Area to provide a vision for the future.

The later “Servicewide Mandates and Policies” section calls readers’ attention to topics that are important to understanding the management direction at the national recreation area. Table 1 summarizes the topics and the conditions toward which management is striving, regardless of alternative. The alternatives in this plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.

This *General Management Plan* does not include descriptions of how particular programs or projects should be prioritized or imple-

mented. Those decisions will be addressed in future, more detailed planning efforts. All future plans will tier from the approved *General Management Plan*.

NEED FOR THE PLAN

This new management plan for Amistad National Recreation Area is needed because the previous comprehensive planning effort for the national recreation area was completed in 1987. Much has occurred since then — patterns and types of visitor use have changed, and the national recreation area was assigned as a unit of the national park system in 1990, after the development of the 1987 plan. There is significant new information about cultural and natural resources, visitor use patterns, and border security issues. Each of these issues has major implications for how visitors access and use the national recreation area and the facilities needed to support those uses, how resources are managed, and how the National Park Service manages its operations.

A general management plan also is needed to meet the requirements of the National Parks and Recreation Act of 1978 and NPS policy, which mandate the development of a general management plan for each unit in the national park system.

THE NEXT STEPS

After the distribution of the *Draft General Management Plan / Environmental Assessment* there will be a 30-day public review and comment period, after which the NPS planning team will prepare a “Finding of No Significant Impact” and the plan can then be implemented, depending on funding and staffing. (The “Finding of No Significant Impact” does not guarantee funds and staff will be available to implement the approved plan.)

IMPLEMENTATION OF THE PLAN

Implementation of the approved plan will depend on future funding. The approval of a plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the approved plan could be many years in the future.

Implementing the approved plan also could be affected by other factors. After the general management plan has been approved, additional feasibility studies and more detailed planning and environmental documentation will be completed, as required, before any proposed actions can be carried out. As part of the planning process, the following consultations will be carried out:

- Appropriate federal and state agencies would be consulted about actions that could affect threatened or endangered species.

- The Texas Historical Commission would be consulted about actions that could adversely affect significant cultural resources.
- The National Park Service would consult with affiliated tribal governments about sacred and other sites of interest to the tribes.

The general management plan does not include descriptions of how particular programs or projects should be prioritized or implemented. Those decisions will be addressed during the more detailed planning associated with strategic plans or implementation plans. All those future more detailed plans will tier from the approved general management plan and will be based on the goals, future conditions, and appropriate types of activities established in the approved general management plan.

GUIDANCE FOR THE PLANNING EFFORT

PURPOSE AND SIGNIFICANCE

Purpose

Purpose statements are based on Amistad National Recreation Area's enabling legislation and legislative history and NPS policies. The statements reaffirm the reasons for which the national recreation area was set aside as a unit of the national park system and provide the foundation for the area's management and use.

The purpose of Amistad National Recreation Area is to

Provide for public outdoor recreation use and enjoyment of the lands and waters associated with the United States portion of the reservoir known as Lake Amistad . . . and protect scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters

Significance

Significance statements capture the essence of Amistad National Recreation Area's importance to our country's natural and cultural heritage. Significance statements do not inventory the national recreation area's resources; rather, they describe Amistad's distinctiveness and help to place the national recreation area within its regional, national, and international contexts. Significance statements answer questions such as, Why are Amistad National Recreation Area's resources distinctive? What do they contribute to our natural and cultural heritage? Defining Amistad's significance helps managers make decisions that will preserve the resources and values necessary to accomplish the national recreation area's purpose.

The significance of Amistad National Recreation Area is as follows.

- As one of only two reservoirs managed jointly by the United States and the Republic of Mexico, Lake Amistad commemorates a water conservation partnership between the two nations.
- The waters of Lake Amistad provide diverse water-based recreational opportunities, including some of the finest recreational black bass fishing in the southwestern United States.
- Amistad National Recreation Area protects and interprets exceptional examples of Lower Pecos River rock art, one of the densest concentrations of Archaic rock art in the New World and comparable in significance to rock art found in Europe, Australia, and Baja California.
- The archeological sites of the Lower Pecos river region, including Amistad National Recreation Area, are among the oldest and best preserved archeological sites in North America and provide important information about the unique cultures and environment of southwest Texas.
- Amistad manages the 3rd largest museum collection in the national park system which consists almost entirely of prehistoric archeological materials, many of which are listed on the National Register, that span over 10,000 years of Native American history.
- Amistad National Recreation Area includes one of the largest tracts of public land available for hunting in southwest Texas.

PRIMARY INTERPRETIVE THEMES

Primary interpretive themes are the stories that need to be told to connect visitors to a national park system unit's resources through

education, enjoyment, understanding, emotion, and inspiration. Developing primary interpretive themes lays the groundwork for the articulation of visitor understanding and appreciation in a general management plan.

Primary interpretive themes are integrally related to significance statements, transforming these factual statements into stories for the public. All primary interpretive themes are of equal priority and importance and form the foundation of the national recreation area's interpretive program, which is built on the bedrock of the significances inherent in the area's natural and cultural values. Primary interpretive themes are the key stories, concepts, and ideas of the national recreation area. They are the groundwork that NPS staff will use to educate visitors about the national recreation area and to inspire them to care for and about the area's resources. With these themes, visitors can form intellectual and emotional connections with the national recreation area's resources and experiences.

Based on the national recreation area's purpose, significance, and primary resources, the following interpretive themes have been developed. Subsequent interpretive planning may elaborate on these primary themes.

- Amistad offers diverse water-based recreation opportunities, including fishing, swimming, waterskiing, and scuba diving. Recreation access is dependent on the water level, which is dependent on the water management policies of other agencies and regional hydrology, geology, and climate. Recreation is incidental to the main purpose of the reservoir; Amistad Dam was constructed for water storage and flood control.
- Amistad is in a transition zone of three major biotic communities — the Chihuahuan Desert to the west, the Balconian to the northeast, and the Tamaulipan scrub to the southeast. Amistad National Recreation Area hosts many Neotropical migrant species, including birds, bats, and monarch butterflies. Other species reach their

latitudinal and longitudinal limits in the Amistad area.

- Archeological remains in the Amistad National Recreation Area represent long periods of human presence. The most spectacular evidence that is interpreted at Amistad National Recreation Area is exceptional examples of Native American rock art. Large polychrome and monochrome pictographs adorn the walls of rock shelters around the reservoir. A nearly complete range of regional styles from very old prehistoric through historic styles complement the other tangible archeological remains found in the area.
- Amistad National Recreation Area manages and protects the third largest museum collection in the national park system.
- Amistad National Recreation Area represents an excellent example of the Texas/Mexico borderlands and cultural area. Frequent cultural, social, and commercial exchanges cross the political border, and the Spanish language continues to remain a vital part of communication.

SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

Special mandates and administrative commitments refer to requirements that are specific to the national recreation area. These formal agreements are often established concurrently with the creation of a unit of the national park system. The enabling legislation for Amistad National Recreation Area contains no specific mandates for the management or development of the national recreation area. The enabling legislation referred to the NPS Organic Act (1916) as the primary guidance for management and development.

SERVICEWIDE MANDATES AND POLICIES

This section identifies what must be done at Amistad National Recreation Area to comply with federal laws and NPS policies. Many management directives are specified in laws and policies guiding the National Park Service and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990 “Protection of Wetlands”); laws governing the preservation of cultural resources (such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and laws about providing public services (such as the Americans with Disabilities Act) — to name a few.

In other words, a general management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control exotic species, protect archeological sites, conserve artifacts, or provide access for people with disabilities. Laws and policies already have decided those and many other things for us. Although attaining some of the conditions set forth in these laws and policies may have been deferred in the national recreation area because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new general management plan.

Some of these laws and executive orders are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service, the General Authorities Act of 1970, the act of March 27, 1978, relating to the management of the national park system, and the National Parks Omnibus Management Act (1998). Other laws and executive orders have much broader application, such as the Endangered Species Act, the National Historic

Preservation Act, and EO 11990, which addresses the protection of wetlands.

The NPS Organic Act (16 USC § 1) provides the fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measures as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life 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.

The National Park System General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogate . . . the purposes and values for which these various areas have been established.”

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in an NPS guidance manual entitled *Management Policies 2001*. The preferred alternative (alternative B) considered in this document incorporates and complies with the provisions of these mandates and policies.

To truly understand the implications of an alternative, it is important to combine the servicewide mandates and policies with the management actions described in the alternative.

Some issues relating to servicewide laws and policies are highlighted because of Amistad's location on the border or because they present potentially significant impacts on resources. These include border security, grazing, and off-road vehicle use.

SECURITY

Border Security

NPS management policies require park unit superintendents to manage law enforcement activities as part of a comprehensive, interdisciplinary effort to protect resources, manage public use, and promote public safety and appropriate enjoyment. The National Park Service is authorized to render cooperative assistance to other law enforcement agencies. Cooperation in law enforcement is important in all units of the national park system, but it is critical at Amistad and other border units.

The U.S.–Mexico borderlands historically have been an unsettled region, a condition that persists to this day. Narcotics smuggling and illegal immigration offer growing challenges for Amistad National Recreation Area and other border NPS units. Moreover, since the events of September 11, 2001, the security requirements for the nation's borders place additional burdens on rangers and other staff. In addition to protecting resources and ensuring visitor safety within the national recreation area's boundaries, NPS rangers and managers at Amistad must be prepared to cooperate with the various agencies of the Department of Homeland Security to support and assist those agencies in ensuring the security of the United States.

Homeland Security

The Department of Homeland Security (DHS) was created to provide the unifying core and the infrastructure for the vast national networks of organizations and institutions

involved in efforts to secure our nation. Securing our borders is a critical component of this effort. The boundaries of Amistad National Recreation Area include 83 miles of the border between the United States and the Republic of Mexico, which totals 1,989 miles. Border security is a real concern of the national recreation area's management and staff. The primary contact for Amistad National Recreation Area in the Department of Homeland Security is the Division of Border and Transportation Security. This division brings the nation's major border security and transportation operations under one roof. The management and staff of Amistad cooperate with several of the agencies in this division, including Customs and Border Protection, Immigration and Customs Enforcement, the Federal Protective Service, and the Federal Law Enforcement Training Center.

The ranger division, other NPS staff, and the recreation area's management would cooperate with the appropriate DHS bureaus as required to help those bureaus fulfill the mission of the Department of Homeland Security and the Division of Border and Transportation Security. The National Park Service also would cooperate with appropriate state and local agencies such as the Texas Department of Public Safety, the Val Verde County Sheriff, and the Del Rio Police Department. The National Park Service would conduct cooperative planning with these bureaus and agencies, as well as others deemed appropriate, to better focus and coordinate the efforts of the National Park Service and these bureaus and agencies in the joint pursuit of national security.

Law Enforcement Needs Assessment

In the recent past, the national recreation area's ranger division has grown to 12 full-time law enforcement rangers to better address issues relating to safety, resource protection, and fulfilling the NPS commitment to

enhancing border security. The national recreation area would continue to strengthen its ranger division as necessary to ensure visitor safety, protect resources, and cooperate in securing our nation's borders. Under the proposed organization for the Division of Visitor and Resource Protection, it is recommended that law enforcement staff and support personnel for this division total 28 full-time-equivalent employees (FTEs). A new law enforcement facility would be developed under the preferred alternative to enhance the ability of the staff, including the ranger division, to fulfill the NPS mission and the national recreation area's commitments to support the efforts of the Department of Homeland Security.

GRAZING

Livestock has grazed at Amistad National Recreation Area since the creation of the dam and reservoir in the 1960s. This activity was allowed under the terms of the 1965 memorandum of agreement between the United States section of the International Boundary and Water Commission and the National Park Service. This agreement guided the development and administration of recreation on the United States side of Amistad International Dam and Reservoir. According to the terms of the agreement, any grazing that was allowed would be confined to the part of Amistad administered by the National Park Service and would be controlled and supervised by the National Park Service after consultation with the Texas Parks and Wildlife Department. The National Park Service considered increasing grazing fees to parity with local levels, but these efforts were met with resistance by neighboring landowners.

The 1987 *General Management Plan / Development Concept Plan* for Amistad continued the policy of issuing special use permits for limited grazing on recreation area lands by livestock belonging to owners of adjacent property, with grazing fees set at 1986 rates.

The 1990 enabling legislation for Amistad National Recreation Area does not authorize grazing within the boundaries of the national recreation area. Further, the legislation voided and superseded all previous agreements with landowners and with the International Boundary and Water Commission. Since 1998, the National Park Service has not issued grazing permits. After discussions with the Department of the Interior solicitor in 2000, the National Park Service concluded that grazing is not a legal activity at Amistad and that special use permits for grazing should not be issued. A 1999 study demonstrated that there were adverse impacts on 60% of the archeological sites in the national recreation area resulting from grazing. It was determined that legal, managed grazing could be allowed only through congressional action. Unauthorized grazing by livestock from adjacent lands continues because Amistad's boundary is unfenced, effectively limiting management of livestock migration onto national recreation area lands.

NPS *Management Policies 2001* classifies all domestic livestock, including cattle, sheep, and goats, as exotic species. The document defines exotic species as species that occupy or could occupy the lands of the national recreation area directly or indirectly as the result of deliberate or accidental human activities. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem at that place. NPS policies require a park system unit to manage any exotic species when that species does the following:

- interferes with natural processes and the perpetuation of natural features, native species, or natural habitats; or
- damages cultural resources;
- significantly hampers the management of the park system unit or adjacent lands; or
- creates a hazard to public safety.

Trespass grazing by cattle, goats, and exotic game species contributes to increased erosion along the reservoir's shoreline and can cause substantial adverse impacts on archeological sites, native plant species, native animal species and their habitat, and water quality. Techniques for controlling exotic species, which must be prudent and feasible, include fencing, relocation, or eradication. The specific management options would be identified in an exotic species management plan developed and implemented after the approval of the *General Management Plan / Environmental Assessment*. That document would evaluate the species' current or potential impacts on the resources. The impact analysis would determine the framework and scope of the exotic species management plan, which in turn would (a) outline an overall strategy for exotic species management and (b) describe the specific control techniques that would successfully manage these species while avoiding significant damage to native species, natural ecological communities, natural ecological processes, cultural resources, and human health and safety. Development of the exotic species management plan would have a separate public involvement process from the *General Management Plan / Environmental Assessment*.

In the interim, it is recommended that the National Park Service and Amistad National Recreation Area take steps to minimize the impact of unauthorized grazing on NPS lands. On the basis of the impact analysis in the *General Management Plan / Environmental Assessment*, the national recreation area would identify areas at particular risk of adverse impacts on cultural and natural resources resulting from grazing. Sensitive resources in these areas would be fenced to prevent additional resource damage or loss. Amistad managers also would work with neighboring landowners to develop strategies to reduce or eliminate incidents of unauthorized grazing on NPS lands. This could include establishing feeding areas for grazing livestock or helping landowners to construct fencing along their

property lines consistent with the *Texas Agricultural Code, Chapter 143*, "Fences; Range Restrictions." The national recreation area would work with landowners to identify the most appropriate areas for feeding stations for livestock.

Amistad management also would continue its policy of relocating or eradicating exotic game species from the recreation area. The National Park Service would work with owners of game ranches on strategies for removing exotic game animals from the national recreation area. These strategies could include limited guided hunts in appropriate seasons, subject to the policies and regulations of the Texas Department of Parks and Wildlife.

OFF-ROAD VEHICLE (ORV) USE

Off-road vehicle use in national park system units is governed by Executive Order 11644 (as amended by Executive Order 11989), which defines off-road vehicles as "any motorized vehicle designed for or capable of cross-country travel on or immediately over, land, water, sand, snow, ice, marsh, swamp-land, or other natural terrain" except any registered motorboat or any vehicle used for emergency purposes). Unless otherwise provided by statute, any time there is a proposal to allow a motor vehicle meeting this description to be used in a park system unit, the provisions of the executive order must be applied.

Within the national park system, routes and areas may be designated for off-road motor vehicle use only by special regulation, and only when it would be consistent with the purposes for which the park system unit was established. Routes and areas may be designated only in locations in which there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values, and in consideration of other visitor uses. The criteria listed in *Management Policies 2001* section 8.2 (Visitor Use) must also be applied to determine whether off-road use may be

allowed. As required by the executive order and the Organic Act, superintendents must immediately close a designated off-road vehicle route whenever the use is causing, or will cause, unacceptable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources. Special regulations are not required when the use of such vehicles is limited to designated park system unit roads.

NPS administrative off-road vehicle use will be limited to what is necessary to manage the public use of designated off-road vehicle routes and areas; to conduct emergency operations, and to accomplish other types of administrative functions that cannot be accomplished reasonably by other means.

Off-road vehicle use at Amistad will be allowed in designated areas and on designated national recreation area roads for street-legal vehicles displaying current state-issued licenses or permits. These areas are described in more detail in Chapter 2, "The Preferred Alternative." Off-road vehicle use will not be allowed off designated national recreation area roads, in areas that contain sensitive cultural or natural resources, or where such use would likely pose an adverse impact on the experiences and safety of visitors. Indicators and standards for this recreational activity have been developed to assist NPS management and staff to monitor vehicle use within the national recreation area and make appropriate adjustments when and where necessary to protect resources, ensure quality visitor experiences, and protect human health and safety. See "User Capacity and Indicators and Standards" section for more information on indicators and standards.

Off-road vehicle use would be allowed in designated portions of visitor use areas at Spur 454, Highway 277 North, and the 406 campgrounds. ORV routes would be

designated to provide access to the lake shore and to areas exposed during periods of low water for the purpose of providing access to the lakeshore for fishing, picnicking, and other recreational activities. A designated national recreation area road from Spur 454 (the abandoned Highway 90 right of way) will provide access for vehicular traffic, including off-road vehicles, to access camping and picnicking areas at Area 454. ORV use at Highway 277 North and the 406 campgrounds would likewise be limited to designated national recreation area roads.

CORE OPERATIONS

The core operations analysis process is designed to assist NPS management in making informed staffing and funding decisions in the context of the national recreation area's legislative authority. The steps in this process include budget cost projections, confirmation of the national recreation area's purpose, and identification of NPS priorities.

Amistad National Recreation Area is scheduled to conduct a core operations analysis in 2006. The preferred alternative in the general management plan focuses on the core mission of Amistad National Recreation Area.

Table 1 summarizes the other most pertinent servicewide mandates and policy topics related to planning and managing Amistad National Recreation Area. Across from each topic are the *desired conditions that the staff is striving to achieve* for that topic; thus, the table is written in the present tense. The alternatives in this plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.

TABLE 1: SERVICEWIDE MANDATES AND POLICIES PERTAINING TO AMISTAD NATIONAL RECREATION AREA

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Amistad National Recreation Area
Relations with Private and Public Organizations, Owners of Adjacent Land, and Government Agencies	<p>The national recreation area is managed as part of a greater ecological, social, economic, and cultural system.</p> <p>Good relations are maintained with owners of adjacent property, surrounding communities, and private and public groups that affect, and are affected by, the national recreation area. Amistad is managed proactively to resolve external issues and concerns and ensure that its values are not compromised.</p> <p>Because Amistad National Recreation Area is an integral part of the larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect Amistad’s resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, neighboring landowners, and all other concerned parties.</p>
	<u>Natural Resources</u>
Air Quality	Air quality in the national recreation area meets national ambient air quality standards for specified pollutants. Amistad’s air quality is maintained or enhanced with no significant deterioration.
Ecosystem Management	Amistad National Recreation Area is managed holistically as part of a greater ecological, social, economic, and cultural system.
Exotic Species	The management of populations of exotic plant and animal species, up to and including eradication, are undertaken wherever such species threaten Amistad’s resources or public health and when control is prudent and feasible.
Fire Management	<p>Amistad National Recreation Area’s fire management programs are designed to meet resource management objectives prescribed for the various areas of the national recreation area and to ensure that the safety of firefighters and the public are not compromised.</p> <p>All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan.</p>
General Natural Resources / Restoration	<p>Native species populations that have been severely reduced in or extirpated from the national recreation area are restored where feasible and sustainable.</p> <p>Populations of native plant and animal species function in as natural condition as possible except where special considerations are warranted.</p>
Geological Resources	<p>Amistad National Recreation Area’s geological resources are preserved and protected as integral components of Amistad’s natural systems.</p> <p>The National Park Service manages caves and karst in accordance with approved cave management plans to perpetuate the natural systems associated with the caves and karst.</p>
Land Protection	Land protection plans are prepared to determine and publicly document what lands or interests in land need to be in public ownership and what means of protection are available to achieve the purposes for which the national recreation area was created.

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Amistad National Recreation Area
Lightscape Management / Night Sky	Excellent opportunities to see the night sky are available. Artificial light sources both within and outside the national recreation area do not unacceptably cause adverse effects on opportunities to see the night sky.
Native Vegetation and Animals	The National Park Service strives to maintain all native plants and animals in the national recreation area as parts of the natural ecosystem.
Natural Soundscapes	The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. Disruptions from recreational uses are managed to provide a high-quality visitor experience in an effort to preserve or restore the natural quiet and natural sounds
Soils	<p>The National Park Service actively seeks to understand and preserve the soil resources of Amistad and to prevent, to the extent possible, erosion, physical removal, or contamination of the soil or its contamination of other resources.</p> <p>Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.</p>
Threatened and Endangered Species	<p>Federally listed and state-listed threatened and endangered species and their habitats are protected and sustained.</p> <p>Native threatened and endangered species populations that have been severely reduced in or extirpated from the national recreation area are restored where feasible and sustainable.</p>
Water Resources	<p>Surface water and groundwater are protected, and water quality meets or exceeds all applicable water quality standards.</p> <p>NPS and NPS-permitted programs and facilities are maintained and operated to avoid polluting surface water and groundwater.</p>
Wetlands	<p>The natural and beneficial values of wetlands are preserved and enhanced.</p> <p>The National Park Service implements a “no net loss of wetlands” policy and strives to achieve a longer-term goal of net gain of wetlands across the national park system through the restoration of previously degraded wetlands.</p> <p>The National Park Service avoids to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands, and the National Park Service avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative.</p> <p>The National Park Service compensates for the remaining unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded.</p>
	<u>Cultural Resources</u>
Archeological Resources	Archeological sites are identified and inventoried and their significance is determined and documented. Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is professionally documented and excavated and the resulting artifacts, materials, and records are curated and conserved in consultation with the Texas State Historic Preservation Office (and American Indian tribes if applicable). Some archeological sites that can be adequately protected may be interpreted for visitors.

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Amistad National Recreation Area
Historic Structures	Historic structures are inventoried and their significance and integrity are evaluated under National Register of Historic Places criteria. The qualities that contribute to the listing or eligibility for listing of historic structures on the national register are protected in accordance with the <i>Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).
Museum Collections	<p>All museum collections (objects, specimens, and manuscript collections) are identified and inventoried, catalogued, documented, preserved, and protected, and provision is made for their access to and use for exhibits, research, and interpretation.</p> <p>The qualities that contribute to the significance of collections are protected in accordance with established standards.</p>
	<u>Visitor Use and Experience</u>
Visitor Use and Experience	<p>Amistad's resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the national recreation area. No activities occur that would cause derogation of the values and purposes for which the national recreation area has been established.</p> <p>For all zones, districts, or other logical management divisions in the national recreation area, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas.</p> <p>Visitors to Amistad have opportunities to understand and appreciate the significance of the national recreation area and its resources and develop a personal stewardship ethic.</p> <p>To the extent feasible, programs, services, and facilities in the national recreation area are accessible to and usable by all people, including those with disabilities.</p>
Commercial Services	<p>Same as Visitor Use and Experience and Park Use Requirements, above.</p> <p>All commercial services require authorization and must be shown to be necessary and/or appropriate and economically feasible. Appropriate planning is done in support of commercial services authorization.</p>
Public Health and Safety	NPS <i>Management Policies 2001</i> says that the saving of human life will take precedence over all other management actions as the National Park Service strives to protect human life and provide for injury-free visits.

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Amistad National Recreation Area
Sustainable Design/ Development	<p style="text-align: center;"><u><i>Other Topics</i></u></p> <p>NPS and concessioner visitor management facilities are harmonious with Amistad’s resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy-efficient, and cost-effective.</p> <p>All decisions regarding Amistad operations, facilities management, and development in the national recreation area — from the initial concept through design and construction — reflect the principles of resource conservation. Thus, all national recreation area developments and operations are sustainable to the maximum degree possible and practicable. New developments and existing facilities are located, built, and modified according to the <i>Guiding Principles of Sustainable Design</i> (NPS 1993) or other similar guidelines.</p> <p>Management decision-making and activities throughout the national park system use a structured decision-making process that looks at all aspects of the decision equally for each alternative. Results are documented and become part of the public record.</p>
Transportation to and within Amistad National Recreation Area	<p>Visitors have reasonable access to the national recreation area, and there are connections from the national recreation area to regional transportation systems, as appropriate. Transportation facilities in the national recreation area provide access for the protection, use, and enjoyment of Amistad’s resources. They preserve the integrity of the surroundings, respect ecological processes, protect Amistad’s resources, and offer the highest visual quality and a rewarding visitor experience.</p> <p>The National Park Service participates in all transportation planning forums that may result in links to Amistad or impact the national recreation area’s resources. Working with federal, tribal, state, and local agencies on transportation issues, the National Park Service seeks reasonable access to Amistad and connections to external transportation systems.</p>
Utilities and Communication Facilities	<p>Amistad’s resources or public enjoyment of the national recreation area are not denigrated by nonconforming uses. Telecommunication structures are permitted in the national recreation area to the extent that they do not jeopardize Amistad’s mission and resources. No new nonconforming use or rights-of-way are permitted through the national recreation area without specific statutory authority and approval by the director of the National Park Service or designated representative, and they are permitted only if there is no practicable alternative to such use of NPS lands.</p>
Hunting	<p>Hunting is allowed under the enabling legislation for Amistad National Recreation Area.</p> <p>The National Park Service will manage hunting at Amistad according to NPS management policies and the rules and regulations of the Texas State Parks and Wildlife Department.</p>

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

Amistad National Recreation Area is in Val Verde County, Texas. Properties surrounding the national recreation area are primarily privately owned residential and agricultural lands. There are a few commercial and state-owned parcels. Laughlin Air Force Base, east of Del Rio, operates a marina on Lake Amistad under a concession agreement. There are no tribal lands nearby.

Several plans have influenced or would be influenced by the approved *General Management Plan* for Amistad National Recreation Area. These plans have been prepared (or are being prepared) by the National Park Service, the U.S. Department of Defense, the United States Air Force, and the state of Texas. Some of them are described briefly here, along with their relationship to this *General Management Plan*.

FINAL GENERAL MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT — BIG BEND NATIONAL PARK (NPS 2004)

The Big Bend plan guides park managers in making decisions about managing natural and cultural resources, visitation, and development in the Big Bend National Park for the next 15 to 20 years. This plan and the *General Management Plan / Environmental Assessment* for Amistad will help the managers of both border parks make decisions about issues of mutual interest, particularly issues of border security.

FINAL RIO GRANDE WILD AND SCENIC RIVER GENERAL MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT (NPS 2005)

This plan guides the management of the Rio Grande Wild and Scenic River for the next 15 to 20 years. As an important link between Big Bend National Park and Amistad National Recreation Area, the findings of this plan will have potential implications for both NPS units. Coordination with Rio Grande Wild and Scenic River is essential for maintaining and improving security along this stretch of the U.S.–Mexico border, as well as for coordinating resource management and recreational uses of the river among the three units.

BACKCOUNTRY MANAGEMENT PLAN: AMISTAD NATIONAL RECREATION AREA (NPS DRAFT 2006)

This plan will outline management strategies for backcountry areas of the national recreation area, consistent with overall management strategies and management zones described in this *General Management Plan / Environmental Assessment*.

BINATIONAL FISHERIES MANAGEMENT PLAN FOR AMISTAD RESERVOIR (TPWD NPS USFWS – DRAFT 2006)

Amistad Reservoir is the site of extensive recreational and competitive sport fishing on both the U.S. and Mexico sides of the international boundary as well as commercial fishing in the Mexican portion of the reservoirs. There are two U.S. federal agencies, one U.S. state agency, one Mexican Federal agency, one Mexican National Fisheries Commission, and one Mexico State agency with interest

and management responsibility for the fishery resources of Amistad Reservoir. This plan was developed to provide a mechanism for coordination in fisheries management actions among the state of Texas, the U.S. National Park Service, the U.S. Fish and Wildlife Service, the Secretaria de Agricultura Ganaderia, Desarrolla Rural, Pesca y Alimentacion, and Comisión Nacional de Acuicultura y Pesca. Each of these agencies has responsibilities for management and use of the fishery resources of the reservoir, and their legislated mandates must be accommodated. Through this plan, coordinated management of fish stocks, consistent and complementary harvest regulations, coordinated biological and chemical monitoring, and coordinated fish stocking and habitat management actions can begin to occur. This plan attempts to lay out agreements with regards to communication protocols, management goals and strategies, law enforcement assistance, joint public education and information efforts, and public access. The plan also identifies important scientific studies to be undertaken.

Currently, obtaining final approval at the federal level in Mexico does not appear likely and the U.S. parties may sign the plan independently.

ENVIRONMENTAL ASSESSMENT, FIRE MANAGEMENT PLAN, AMISTAD NATIONAL RECREATION AREA (NPS 2005)

This plan outlines a comprehensive strategy for combating wildfires and managing flammable vegetation near structures, protecting sensitive cultural and biological resources, removing shrubs around boat access areas, and using prescribed burns to control nonnative plant species. It provides specific resource management guidance within the overall context of the national recreation area's general management plan and consistent with the prescriptions of the upland management zones.

FINAL ENVIRONMENTAL ASSESSMENT, PERSONAL WATERCRAFT USE, AMISTAD NATIONAL RECREATION AREA (NPS 2004)

The plan evaluates a range of alternatives and strategies for managing personal watercraft use at Amistad to ensure the protection of the national recreation area's resources and values while offering recreational opportunities as provided for in the national recreation area's enabling legislation, purpose, mission, and goals. This document concluded that personal watercraft use will continue at Amistad under a special NPS regulation. The *Personal Watercraft Use Environmental Assessment*, in combination with the *General Management Plan / Environmental Assessment* will give managers additional guidance for managing this recreational activity.

LAND PROTECTION PLAN, AMISTAD NATIONAL RECREATION AREA (NPS 2000)

Department of the Interior and NPS policies require the development of a land protection plan for all units of the national park system. This plan sets long-range goals for protecting private land and other nonfederal property within the boundaries of national park system units, including Amistad National Recreation Area. The plan addresses all land within the boundary of Amistad that the National Park Service considers potentially vulnerable to future resource damage. The findings of this land protection plan provide the guidance on the adequacy of the boundaries of the national recreation area.

ALTERNATIVE TRANSPORTATION PLAN (ATP), AMISTAD NATIONAL RECREATION AREA (NPS DRAFT 2006)

The two-phase ATP study has been conducted in support of the general management plan for Amistad National Recreation Area. Phase I consisted of an

assessment of past and present conditions at Amistad, including a summary of historic and seasonal visitation patterns within Amistad National Recreation Area; an analysis of traffic distribution patterns on a national recreation area-wide basis and by major recreation activity over the last decade; a comparison of visitor traffic volumes at the nine major recreational use areas; an analysis of traffic volumes at low, medium, and high water levels in the reservoir; and an inventory of areas in the national recreation area detailing traffic, existing uses, key management issues, and parking and access.

Phase II analyzes in more detail traffic and use patterns at the most heavily used recreation areas in the national recreation area and devise more detailed management strategies for adapting to changing use patterns at low, medium, and high water levels.

These management strategies have been incorporated in the preferred alternative in this document to provide for a more flexible management approach to this dynamic recreational resource.

ENVIRONMENTAL ASSESSMENT, LAUGHLIN AIR FORCE BASE, SOUTHWIND MARINA IMPROVEMENTS (USAF)

This environmental assessment will analyze the effects of improvements to the Air Force marina at Lake Amistad. The findings of this planning effort will have implications for managing visitor use and developing facilities at Amistad National Recreation Area.

RESOURCE MANAGEMENT PLAN: SEMINOLE CANYON STATE PARK AND HISTORIC SITE (TPWD, IN PROGRESS)

The purpose of this plan, prepared by the Texas Parks and Wildlife Department, is to include a compilation of all known informa-

tion about the natural and cultural resources of the property, to describe special resources in detail, and to recommend actions for protecting, preserving, restoring, and managing the resources. This document will identify and recommend needed baseline inventories, monitoring requirements, and research projects needed to address specific problems. In addition, the resource management plan is designed to provide for the site manager and personnel a summary overview of laws and policies concerning the property's resources.

As part of this planning process, Texas Parks and Wildlife Department also will prepare an interpretive master plan for Seminole Canyon State Park and Historic Site. The purpose of that plan will be to guide park management and staff in future interpretive endeavors. It will address public programming, educational opportunities, staff training needs and media. The plan will include a site overview; significance, purpose and mission statements; interpretive themes and subthemes; site-specific interpretive goals and objectives; implementation strategies; a timeline and responsibilities matrix; and appended support materials. The plan, which is designed to be a dynamic document, will be reviewed and updated annually. This plan will help guide cooperative interpretive and educational efforts between Seminole Canyon and Amistad National Recreation Area.

DEVILS RIVER CONSERVATION AREA PLAN (THE NATURE CONSERVANCY) (IN PROGRESS)

The Nature Conservancy owns almost 90,000 acres and holds conservation easements for 50,000 additional acres along the Devils River. The primary goal of the conservation area plan for the Devils River is the permanent protection of the river and the tremendous biodiversity it supports. Scientific research is a significant component of this project's management approach. Extensive habitat and wildlife inventories have been conducted, and special programs are in place for protecting

certain threatened species and the overall health of the Devils River.

The Nature Conservancy will provide long-term stewardship for this special part of Texas through fee ownership and partnering with neighbors and conservation buyers. Most of the land owned by the Nature Conservancy eventually will be sold to conservation buyers who will donate conservation easements back

to the Nature Conservancy. This plan and the *General Management Plan / Environmental Assessment* for Amistad National Recreation Area will form the foundation for cooperation between the National Park Service and the Nature Conservancy in the management of mutual concern of the Devils River, including water quality and exotic species management.

PLANNING ISSUES AND CONCERNS

INTRODUCTION

The general public, NPS staff, and representatives from various organizations identified several issues and concerns during scoping (early information gathering) for this plan. The primary goal of scoping is to identify issues and determine the range of alternatives to be addressed. During scoping, the NPS staff provides an overview of the proposed project, including purpose and need and alternatives. The public is asked to submit comments, concerns, and suggestions. An issue is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Comments were solicited at public meetings, through planning newsletters, and on the national recreation area's Internet site (see chapter 5, "Consultation and Coordination").

Comments received during scoping demonstrated that there is much that the public likes about Amistad National Recreation Area. The stated issues and concerns generally involve determining the appropriate visitor use, types and levels of facilities, services, and activities while remaining compatible with desired resource conditions. A general management plan provides strategies for addressing the issues and setting long-term resource and visitor use goals within the context of the national recreation area's purpose, significance, and special mandates.

ISSUES

The following issues were identified for Amistad National Recreation Area.

Security

Like other national park system border units, Amistad National Recreation Area faces law enforcement challenges related to drug smuggling, illegal immigration, and securing the borders of the United States. Eighty-three miles of the U.S.–Mexico border are within the boundaries of the national recreation area. Maintaining a safe environment for visitors and meeting the NPS commitments to the Department of Homeland Security is an ongoing challenge for rangers and managers.

Development

The current administrative facilities in Amistad National Recreation Area are inadequate to meet staff, management, and visitor needs. The ranger division confronts numerous complex issues characteristic of its location on the United States–Mexican border. Amistad Reservoir is being used as a smuggling route for undocumented aliens and illegal drugs. In the past there has been a dramatic increase in the seizure of drugs that have been transported through the national recreation area. Drug smuggling activity has been taking place in heavy visitor use areas such as boat ramps and popular fishing areas. This mixture of illicit and legitimate uses within national recreation area boundaries poses serious potential threats to the safety of park visitors and NPS staff.

In addition, the ranger division has increasing border security responsibilities in cooperation with the Department of Homeland Security. In order to meet these commitments to the issues of illegal immigration, drug interdiction, and border security, the NPS ranger division has grown substantially but the support facilities for ranger activities have not kept pace with increased demand.

The facilities available to the ranger division are out of compliance with NPS policy regarding ranger physical or tactical training. Existing facilities are not sufficient to meet NPS Health and Fitness Guidelines related to employee fitness and wellness. A modular building at Diablo East provides temporary ranger headquarters, but it is barely adequate for current needs. The national recreation area has insufficient facilities for secure storage of weapons and ammunition, storage of evidence and contraband, canine operations, and emergency operations and communications.

National recreation area operations are divided between the original headquarters and a leased, recently renovated visitor information center and maintenance facility on U.S. Highway 90 near Black Brush Point. Visitor services and maintenance are housed at the new visitor facility. The headquarters and offices for program managers are at the original headquarters building, judged by a former regional director as the worst facility she had seen in her entire career. Amistad needs a new facility that consolidates all visitor, administrative, and maintenance functions. More space is also required for the cooperating association's bookstore. There is also a need for an educational pavilion in the national recreation area to host student groups for field-based educational programs.

Development and Use Adjacent to the National Recreation Area

Increasing residential development and suburban growth from the city of Del Rio could result in adverse impacts on water quality, viewsheds, and wildlife habitat.

Exotic Species

Many species of invasive exotic plants and animals have become established through-

out much of the national recreation area, threatening native species. This has resulted partly from past use of the area for livestock grazing, the proliferation of hunting ranches in southwest Texas, and the regional spread of exotic plant species and noxious weeds. In time, these aggressive exotic plant and animal species can greatly expand their populations, alter wildlife habitats, and change scenery by smothering and displacing native species. These effects, which are already occurring in some parts of the national recreation area, will worsen substantially if left untreated. A sustained effort is needed to control these internal threats to the native species and their natural habitats.

Inadequate Facilities

The use of many boat ramps at Amistad National Recreation Area can be restricted because of dramatic fluctuations in water levels in the reservoir. Some campgrounds are inundated in periods of high water. To respond adequately to visitor needs during peak use periods, these facilities must be modified and/or upgraded to function across a broad range of pool elevations.

Orientation

Visitors to Amistad National Recreation Area have difficulty gaining a full understanding of the area and its historical context. The national recreation area's wayside exhibits are outdated and should be replaced. Some highways leading to the national recreation area are inadequately marked to guide visitors to NPS facilities.

NPS Operations

Operations relating to security and visitor services need to be improved. Specifically, potential security risks have been identified at several locations in the national recreation

area. Communication systems need to be improved to give visitors information about access and services.

Fee Program

Fees for activities such as camping and boating are collected through the Federal Recreation Fee Program. Fees for these activities must be evaluated to ensure that they are comparable to other similar activities in the surrounding area and consistent with NPS management policies governing recreation fees. In addition, fees collected outside the Recreation Fee Program for activities such as hunting, tournament fishing, commercial filming, and other special uses must also be evaluated to ensure that they are equitable and consistent with NPS policies.

Partnerships

Partnerships with federal, state, local, and private agencies and organizations are needed to enhance the national recreation area's ability to address management issues related to managing natural and cultural resources, education and interpretation, and security of the national recreation area and the border.

Visitor Facilities

Some facilities such as fish-cleaning stations, campgrounds, picnic areas, and boat launch areas need to be improved. Some of these facilities must be modified to adapt to fluctuating water levels.

User Capacity

Under the 1978 National Parks and Recreation Act (Public Law [PL] 95-625), the National Park Service is required to address the

issue of carrying capacity, or user capacity, in its general management plans. The concept of user capacity is intended to safeguard the quality of the resources and visitor experiences. This plan defines indicators and standards that will help managers to make decisions in areas where resources or visitor experiences could be adversely affected. See the later "User Capacity and Indicators and Standards" section for more information.

ISSUES AND CONCERNS NOT ADDRESSED IN THIS PLAN

Not all the issues or concerns raised by the public are included in this *General Management Plan*. Other issues raised by the public were not considered because they

- are already prescribed by law, regulation, or policy (see "Servicewide Mandates and Policies" section).
- would be in violation of laws, regulations, or policies
- were at a level that was too detailed for a general management plan and are more appropriately addressed in subsequent planning documents

This section briefly describes each of these issues and the basis for excluding them from this general management plan.

Wilderness

A wilderness suitability assessment has been prepared for Amistad National Recreation Area. This assessment finds that the lands of the national recreation area do not meet the wilderness criteria and that such a designation would not be appropriate for this unit of the national park system. Therefore, this topic will not be addressed in this *General Management Plan*.

IMPACT TOPICS — RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

IMPACT TOPICS DEFINED

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, NPS general management plans are accompanied by environmental documents that identify the anticipated impacts of possible actions on resources and on visitors and neighbors. Impacts are organized by topic, such as “impacts on the visitor experience” or “impacts on vegetation and soils.” Impact topics serve to focus the environmental analysis and to ensure the relevance of impact evaluation.

The impact topics identified for this plan are outlined in this section; they were identified on the basis of federal laws and other legal requirements, Council on Environmental Quality (CEQ) guidelines, NPS management policies, staff subject-matter expertise, and issues and concerns expressed by the public and other agencies early in the planning process (see previous section). Also included is a discussion of some impact topics that are commonly addressed in other NPS unit planning but that are not addressed in this plan for the reasons given.

IMPACT TOPICS CONSIDERED

Natural Resources

Soils and Vegetation. The Organic Act and NPS *Management Policies 2001* both require the protection and conservation of soil and vegetation resources that could be affected by actions that would change human use and development patterns in the national recreation area. Project alternatives have the potential to affect soils and vegetation resources.

Water Quality. The water resources in the national recreation area are protected and managed under the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act of 1977. NPS *Management Policies 2001* also requires the protection and conservation of water quality. Changes in water quality can affect wildlife populations and visitors. The alternatives could result in increased development and increased use, as well as increased soil erosion, all of which could affect water quality. This would be of concern to visitors and managers.

Wildlife. As described for soils and vegetation, the Organic Act and NPS *Management Policies 2001* require the protection and conservation of wildlife resources that could be affected by actions changing the human use and development patterns in the national recreation area. The mammals, birds, amphibians, reptiles, and fish populations in the national recreation area are important resources; they are also important to visitor experiences. Actions proposed in the alternatives have the potential to adversely affect wildlife resources. Any loss of wildlife habitat or decreases in wildlife populations would be of concern to managers, visitors, and the public.

Threatened and Endangered Species. The Endangered Species Act requires federal agencies to ensure that their activities will not jeopardize the existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. Consultation with the U.S. Fish and Wildlife Service and Texas Department of Natural Resources identified a number of threatened, endangered, or species of concern that warrant inclusion of this topic in this *General Management Plan / Environmental Assessment*. Actions proposed have the potential to affect listed species.

Cultural Resources

The National Historic Preservation Act and the National Environmental Policy Act require that the effects of any federal undertaking on cultural resource be examined. *NPS Management Policies 2001* and *Cultural Resource Management Guideline* Director's Order (DO-28) call for the consideration of cultural resources in planning proposals. The actions proposed in this plan could affect archeological resources and museum collections.

Visitor Use and Experience

The planning team identified visitor experience as an important issue that could be appreciably affected under the alternatives. The Organic Act and *NPS Management Policies 2001* direct the National Park Service to provide enjoyment opportunities for visitors that are uniquely suited and appropriate to the resources found in the national recreation area. A number of different aspects of visitation and enjoyment are evaluated: visitor uses, recreational opportunities, access to orientation, information and interpretation, and visitor facilities.

Socioeconomic Environment

The National Environmental Policy Act requires the examination of social and economic impacts caused by federal actions. Amistad National Recreation Area is on the outskirts of the city of Del Rio in Val Verde County. This is one of the largest counties in Texas in area, but it has a relatively small population. Most of that population is concentrated in Del Rio.

Amistad National Recreation Area affects the socioeconomy of the city of Del Rio and Val Verde County. Accordingly, residents and businesses (e.g., restaurants and hotels) in the region are concerned about changes in

the management of the national recreation area that might affect their lives and the socioeconomic environment and opportunities. Impact topics are land use, economy, community services, and ways of life.

Visitor Access and Transportation

Visitor access and local transportation were identified as a potential impact topic, including visitor safety and access to the national recreation area.

NPS Operations, Facilities, and Concessions

Operations and Facilities. The alternatives proposed in this plan could affect NPS operations and facilities in the national recreation area. Topics include staffing, maintenance, commercial services, facilities, emergency response time, ability to enforce regulations and protect national recreation area values, the health and safety of employees and visitors, the management of collections and other resources, and administrative access.

Concessions. Actions proposed in the alternatives could adversely or beneficially affect concessioners and holders of incidental business permits at the national recreation area. In turn, this could affect the experience of clients and other visitors.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Some impact topics that commonly are considered during the planning process were not relevant to the development of this plan for Amistad National Recreation Area for the following reasons: (a) implementing the alternatives would have no effect or a negligible effect on the topic or resource, or (b) the resource does not occur in the national recreation area. These topics are as follows:

Natural Resources

Air Quality. The guidelines for preparing environmental documents prepared by the President's Council on Environmental Quality require that the lead agency analyze the impacts of the proposed action and alternatives on air quality. Under each of the management alternatives for Amistad National Recreation Area, visitor use and administrative operations would produce air pollutant emissions from motor vehicles and motorized equipment. Some dust and fumes would be generated during the maintenance, improvement, construction, or removal of facilities. The National Park Service would observe established policy requiring the use of energy-efficient and environmentally friendly products and processes whenever possible. Although public visitation and motor vehicle use are expected to increase during the next 20 years, levels of vehicle exhaust are not expected to increase dramatically or to contribute significantly to regional air pollutant loads.

The impacts of these emissions are deemed to be negligible on the local environment and regional air quality for both alternatives. Therefore, they are excluded from further environmental analysis.

Wetlands. The water resources in the national recreation area, including wetlands, are protected and managed in accordance with *NPS Management Policies 2001* (4.6.5) "Protection of Wetlands," and NPS DO 77-1 and its accompanying procedural manual. This guidance requires the National Park Service to protect and enhance natural wetland values and to examine the impacts on wetlands.

The impacts of the actions under both alternatives would result in only a negligible impact on the wetlands of the national recreation area. Development will be carried out in previously disturbed areas or upland areas in which no wetlands are present. No

visitor activities are proposed in or around the national recreation area's wetlands. Therefore, this topic has been eliminated from further analysis.

Floodplain Values and Flooding. The floodplains of the Pecos River, the Devils River, and the Rio Grande upstream of Amistad Dam are all submerged by the waters of Lake Amistad. Approximately 3 miles of the Rio Grande downstream of the dam are within Amistad's boundary. However, water flows in this stretch of the river are controlled by releases from the dam. Furthermore, no development for this area of the national recreation area is proposed under either alternative. Therefore, since neither alternative would affect floodplains, this topic has been dismissed from further consideration.

Geologic Hazards. There are no specific geologic hazards (such as earthquakes, volcanoes, or landslides) in or near Amistad National Recreation Area. There is potential for cliffs and other areas to collapse into Lake Amistad as part of the natural erosion process. None of the actions analyzed in this plan would affect this natural process. Therefore, this topic has been dismissed from further consideration.

Geologic Resources. *NPS Management Policies 2001* require the lead agency to analyze the impacts of the proposed action and alternatives on geologic resources. Impacts on soils are assessed separately in the "Environmental Consequences" chapter. NPS policy prohibits the surface mining of soil, gravel, cinder, or rock materials for any operations purposes, including the construction of roads or facilities. Under either of the management alternatives for Amistad National Recreation Area, most modifications to access roads and facilities would be limited to existing disturbed areas and would not be likely to require blasting or other modification of bedrock geology. For these reasons, the proposed action and the alternatives would result in a negligible effect on the geologic resources of the regional environment;

therefore, this topic has been excluded from further environmental analysis.

Lightscape Management. In accordance with its *Management Policies 2001*, the National Park Service strives to preserve natural ambient lightscares, which are natural resources and values that exist in the absence of human-originated light. The national recreation area strives to limit the use of artificial outdoor lighting to that necessary for basic safety requirements, to ensure that all outdoor lighting is shielded to the maximum extent possible, and to keep light on the intended subject and out of the night sky. None of the proposed actions would have an appreciable effect on the ambient lightscares. Therefore, lightscape management was dismissed as an impact topic.

Prime or Unique Farmland. The 1981 Farmland Protection Policy Act (PL 97-98) was passed to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses and to ensure that federal programs are administered in a manner that, to the extent practicable, is compatible with state and local government and private programs and policies to protect farmland.

Prime farmlands are defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Prime farmlands have the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no

rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (*Soil Survey Manual, USDA Handbook 18*, October 1993).

Unique farmlands are lands other than prime farmland that are used for the production of specific high value food and fiber crops. They have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.

Farmland, other than prime and unique, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the state or local government, is also considered farmland for the purposes of the act.

According to data from the Natural Resources Conservation Service, U.S. Department of Agriculture, prime and unique agricultural soils do not exist in Amistad National Recreation Area. Thus, there is no need to evaluate the impacts of the alternatives on this topic.

Wild and Scenic Rivers. The Rio Grande Wild and Scenic River is upstream of Amistad National Recreation Area, but it does not enter the recreation area itself. None of the actions in the management alternatives have the potential to affect the wild and scenic river. Therefore, this topic has been dismissed from further analysis.

Cultural Resources

Submerged Historic Structures. The flooding of portions of the Pecos, Devils, and Rio Grande valleys creating Lake Amistad submerged numerous farmhouses and other structures. None of the actions proposed in the alternatives poses potential impacts on these

resources. Therefore, this topic was dismissed from further analysis.

Ethnographic Resources. A class 1 ethnographic survey has been completed for the national recreation area. There are no known ethnographic resources on federal lands at Amistad. Currently, no Native American groups have expressed an interest in the management of ethnographic resources at Amistad National Recreation Area, nor has any group requested participation in environmental management issues. NPS staff initiated ethnographic research in the mid 1990s to identify potentially affiliated Native American groups residing in the United States. This research was finally completed and published in late 2002 as an “Ethnographic Literature Review,” which will form the basis for a future ethnographic affiliation study. Therefore, this topic was dismissed from further analysis.

Cultural Landscapes. No cultural landscapes have been identified for Amistad National Recreation Area. Therefore, this topic was dismissed from further analysis.

Sacred Sites. According to EO 13007, “Indian Sacred Sites” (1996), the National Park Service will accommodate, to the extent practicable, access to and ceremonial use of Indian sacred sites by religious practitioners from recognized American Indian and Alaska Native tribes and will avoid adversely affecting the integrity of such sacred sites. According to the findings of the *Amistad National Recreation Area American Indian Tribal Affiliation Study*, published jointly by the Texas Department of Transportation and the National Park Service, several tribes, including the Tonkawa, Apache, Comanche, and Seminole tribes, may have cultural affiliations with lands in the national recreation area. Some of these lands may have spiritual and religious significance to one or more of these tribes. However, because no known sites that may be

important to the tribes would be affected by actions proposed in the alternatives of this plan, the impacts on sacred sites will not be analyzed further.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by agencies of the Department of the Interior be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Amistad National Recreation Area. The lands composing the national recreation area are not held in trust by the secretary of the interior for the benefit of Indians because of their status as Indians. Therefore, the topic of Indian trust resources was dismissed from further analysis.

Public Health and Safety

The proposed developments and actions in the alternatives would not result in any identifiable adverse impacts on human health or safety. The alternatives were designed with consideration for factors relating to health and safety and to eliminate or minimize potential impacts to the greatest extent possible. Consequently, negligible adverse impacts on public health and safety are anticipated. Therefore, this topic was dismissed from further analysis.

Land Use

The basic land use of the national recreation area as a public recreation and wilderness management area is in conformance with local land use plans, and because the proposed management zones under both the alternatives would not change these basic uses, there are no

anticipated conflicts with local land use planning. The creation of more recreation and visitor service opportunities in the national recreation area as proposed under certain of the alternatives is consistent with existing land uses or local (non-NPS) land use plans. It is anticipated that the actions of the alternatives would not contribute measurably to additional residential or commercial growth. Therefore, only negligible adverse impacts on land use are anticipated, and there is no need to analyze the impacts of the alternatives on land use.

Environmental Justice

EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that all federal agencies incorporate environmental justice into their missions by identifying and addressing disproportionately high adverse environmental effects that their programs and policies cause on minorities and low-income populations and communities.

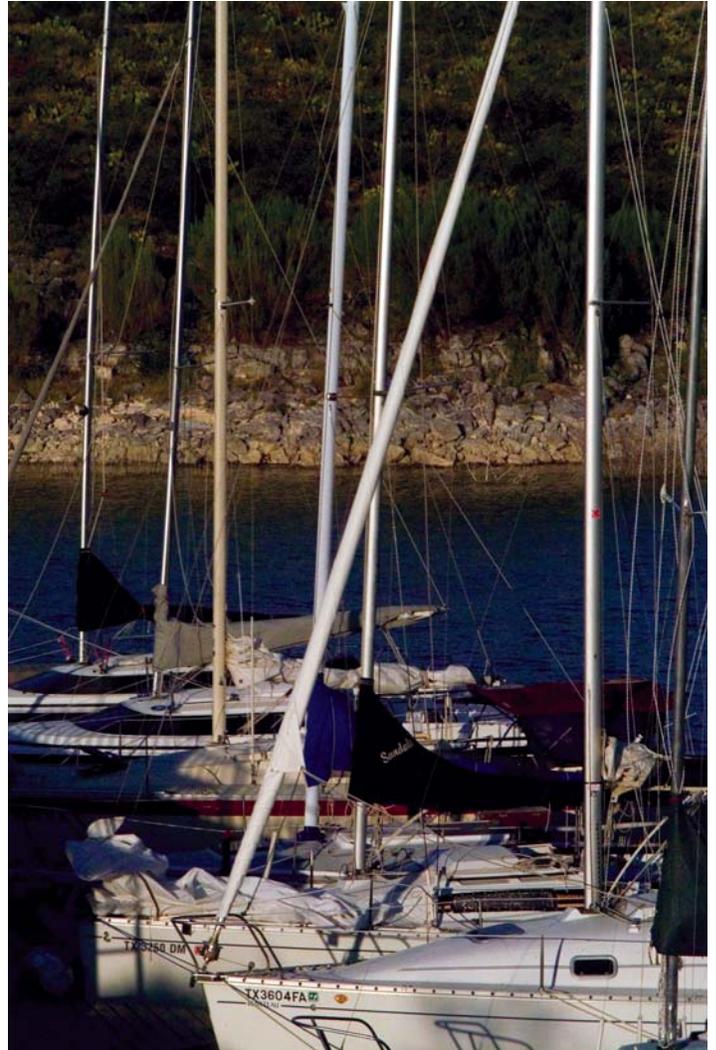
For the purpose of fulfilling EO 12898, in the context of the National Environmental Policy Act, the alternatives addressed in this plan were assessed during the planning process. It was determined that neither of these alternatives would result in dispro-

portionately high direct or indirect adverse effects on any minority or low-income population or community. The following information contributed to this conclusion:

- The developments and actions in the alternatives would not result in any identifiable human health effects. Therefore, there would be no direct or indirect effects on human health in any minority or low-income population or community.
- The impacts on the natural and physical environment that would result from either of the alternatives would not disproportionately adversely affect any minority or low-income population or community or be specific to such populations or communities.
- The alternatives would not result in any identified effects that would be specific to any minority or low-income community.

The effects on the socioeconomic environment caused by implementing the actions of the alternatives would be minor or positive and would occur mostly in the geographic area near the national recreation area. Such impacts would not be expected to substantially alter the physical and social structure of nearby communities. Therefore, this topic will not be analyzed further in this document.

Alternatives, Including the Preferred Alternative



INTRODUCTION

Many aspects of the desired future conditions in Amistad National Recreation Area are defined in the establishing legislation, the national recreation area's purpose and significance statements, and the servicewide mandates and policies (described earlier). Within these parameters, the National Park Service solicited input from the public, NPS staff, government agencies, and other organizations regarding issues and desired conditions for the national recreation area. The planning team gathered information about existing visitor use and the condition of the national recreation area's facilities and resources. They considered which areas attract visitors and which areas have sensitive resources. Using that information, the team developed a set of four management zones for the lake and five management zones for the upland portion of the national recreation area. The preferred alternative reflects the range of ideas proposed by the national recreation area staff and the public.

This chapter describes the management zones and the alternatives for managing Amistad National Recreation Area for the next 15–20 years. It includes tables summarizing the key differences between the alternatives and the key differences in the impacts that would be expected from implementing each alternative. (The summary of impacts table is based on the analysis in chapter 4, the “Environmental Consequences” chapter) This chapter also contains descriptions of the mitigating measures that would be used to reduce or avoid impacts, the future studies that would be needed, and the environmentally preferred alternative.

MANAGEMENT ZONES AND ALTERNATIVES

The building blocks for reaching an approved plan for managing a national park system unit

are the management zones and the alternatives. All are developed within the scope of the national recreation area's purpose, significance, mandates, and legislation.

Management zones prescribe desired conditions for resources and visitor experiences in different parts of the national recreation area. Management zones are determined for each unit of the national park system; however, the management zones for one unit are not likely to be the same as those of any other national park system unit, although some might be similar. The management zones identify the widest range of potential appropriate resource conditions, visitor experiences, and facilities for the national recreation area that fall within the scope of Amistad's purpose, significance, and special mandates.

This *Draft General Management Plan / Environmental Assessment* presents two alternatives for the future management of Amistad National Recreation Area — the “no-action” alternative and the alternative preferred by the National Park Service. Alternative A, the no-action alternative, which would involve continuing the existing management direction, is included as a baseline for comparing the consequences of implementing the preferred alternative. Alternative B, the preferred alternative, presents a different way to manage resources and visitor uses and improve facilities and infrastructure at the national recreation area. This alternative embodies what the public and the National Park Service want to see accomplished at Amistad National Recreation Area with regard to natural resource conditions, cultural resource conditions, and the visitor use and experience. The actual configuration for the action alternative was developed by overlaying the management zones (described later) on a map of the national recreation area.

As was mentioned above in the “Guidance for Planning” section, the National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies regardless of the alternative that is ultimately selected. These mandates and policies are not repeated in this chapter.

BOUNDARY ADJUSTMENTS — LAND PROTECTION PLAN

The enabling legislation for Amistad National Recreation Area authorized a maximum of 58,500 acres in federal ownership. The National Park Service currently owns and manages 57,292.44 acres within the national recreation area boundaries. Under the legislation, an additional 1,207.56 acres within the authorized boundaries could be acquired.

Amistad National Recreation Area prepared a *Land Protection Plan* (NPS 2000a) that identified significant resources within its boundaries that are not owned by the agency. The *Land Protection Plan* also establishes priorities for the acquisition of these significant properties.

It has been determined that there is no need to adjust the legislated boundaries of Amistad National Recreation Area. No important resources or values related to the national recreation area’s purposes have been identified outside the boundary that are not currently being adequately protected and managed. No operational or management issues relating to the national recreation area’s

boundaries have been identified. There is no need to adjust the national recreation area’s boundaries to protect resources that are critical to fulfilling the national recreation area’s purposes.

All issues relating to potential boundary adjustments and land acquisition will be determined by the findings of the *Land Protection Plan*. Thus, this issue will not be addressed in this *General Management Plan / Environmental Assessment*.

FORMULATING THE PREFERRED ALTERNATIVE

The action alternative focuses on *what* resource conditions and visitor uses and experiences and opportunities should be at the national recreation area, rather than on the details of *how* these conditions and uses or experiences should be achieved.

More detailed plans or studies will be required before most conditions proposed in the alternatives can be achieved. Implementing any alternative also depends on future funding and environmental compliance. This plan does not guarantee that additional funding will be forthcoming. The plan establishes a vision for the future that will guide the day-to-day and year-to-year management of the national recreation area, but full implementation could take many years.

MANAGEMENT ZONES

Management zones prescribe specific resource conditions and visitor experiences to be achieved and maintained in each particular area of Amistad National Recreation Area under the preferred alternative. Each zone includes the types of activities and facilities that are appropriate in that management zone. The management zones were presented to the public in *Newsletter 2* and were modified in response to public comments.

In formulating the preferred alternative, the management zones were placed in different locations or configurations on a map of the national recreation area according to the overall intent (concept) of the alternative. This following section describes the location of the upland management zones. The boundaries of the water management zones correspond to those of the upland management zones.

MANAGEMENT ZONES AND RELATED ACTIONS

This section describes how different areas of the national recreation area would be managed and what actions the National Park Service would take under the preferred alternative. These actions are those believed most likely to take place over the next 15-20 years in the national recreation area given the preferred alternative's concept, management prescriptions, the conditions that already exist in the recreation area, and the national recreation area's environmental constraints. Under this alternative, any new facilities would be constructed in already disturbed areas. Disturbance to sensitive areas such as threatened and endangered species habitat and archeological sites would also be avoided or mitigated. (See "Mitigative Measures" section.)

Upland Management Zones

Under the preferred alternative, most of the national recreation area would be zoned either in the rural developed zone or the rural natural zone. The rural natural zone would be slightly larger than the rural developed zone. The remainder of the national recreation area would be zoned, in descending order, in the primitive zone, the Pecos cultural zone, and the semiprimitive zone.

Rural Developed Zone

This zone would contain the largest single share of the lands in the national recreation area. The lands zoned rural developed would include: all lands on the southeast shore of the reservoir from the dam to Highway 277 South. This area includes Diablo East, Black Brush Point, Spur 454, and the south side of San Pedro Canyon; Rough Canyon from Rough Canyon Cliffs to just south of Indian Springs; and Big Canyon area across from Rough Canyon; and the lands on the north shore including Amistad Acres and Box Canyon.

Visitor use in this area would include camping, hiking, biking, horseback riding, and picnicking.

Most of the development proposed under the preferred alternative would occur in this zone. All new development would be undertaken to provide additional recreational activities for visitors and/or to adapt NPS facilities to fluctuating water levels in the reservoir. Development in this zone would include a new NPS visitor center at Diablo East. The new maintenance facility and law enforcement facility would also be located in this zone. Other new development in this zone could include an educational pavilion at Diablo East and improved and expanded camping facilities at Diablo East, Rough

Canyon, Governor's Landing, and San Pedro/Spur 454. The access road to Spur 454 would be improved.

Security measures, including controlled nighttime access, would be installed at Governor's Landing. More paved parking would be developed at Diablo East. Additional parking would be provided at Highway 277 South. Trails would be developed between Diablo East and Black Brush Point for access during periods of low and medium water levels and in the upland areas around Diablo East. Improved directional visitor information and interpretive signs would be at Diablo East, Black Brush Point, San Pedro/Spur 454, Highway 277 South, and Rough Canyon. Biking and equestrian trails would be developed at Spur 454. Visitor facilities at San Pedro/Spur 454 would be expanded to accommodate more local users. Facilities for SCUBA concessions could be developed at Diablo East. Concession operations at Box Canyon would be expanded. Swim beaches at Rough Canyon would be improved. Picnic sites at Highway 277 South would be improved and expanded.

Rural Natural Zone

This zone would encompass the next largest portion of national recreation area land and would include the following areas: the north and east portions of San Pedro Canyon east of Highway 277 and north to the Rough Canyon Cliffs; the Devils River Canyon north of Rough Canyon and Big Canyon to Lowry Springs; the west side of Devils River Canyon south of Rough Canyon Cliffs; Castle Canyon; the area north of Box Canyon and Cow Creek

Canyon; and the national recreation area lands below Amistad Dam.

Some development would occur in this zone. This could include improvement and expansion of existing campgrounds, parking areas, boat docks, launch sites, and fuel facilities.

This zone would encompass the lands from Cow Creek Canyon to Live Oak Canyon on the Rio Grande and Lowry Springs to Satan Canyon on the Devil's River.

Development in this zone would be limited. Facilities could include unobtrusive information stations.

Primitive Zone

This zone would encompass the lands from Live Oak Creek to the national recreation area boundary on the Rio Grande and from Satan Canyon to the national recreation area boundary on the Devil's River.

Development in this area would include only minimal facilities necessary for resource protection and visitor safety.

The management zones for Amistad National Recreation Area are presented in the chart on the next pages. Visitor experiences, resource conditions, and appropriate activities and facilities are described for each management zone.

Table 2 - 1: LAKE MANAGEMENT ZONES

Concept	Resource Conditions	Visitor Experience	Appropriate Facilities and Activities
Rural Developed	<ul style="list-style-type: none"> • Significant or sensitive cultural and natural resources would be protected to minimize impacts • Natural environment would be highly modified to accommodate visitor activities and facility development 	<ul style="list-style-type: none"> • High potential for contact with park staff and other visitors • Would encounter a park-like setting • Would be able to choose from a diverse array of recreational activities • Could anticipate a safe and controlled recreational environment • Opportunities to learn about the park's natural and cultural resources 	<ul style="list-style-type: none"> • Visitor contact facilities • Boat launch sites • Marinas • Boat docks • Boat fuel facilities • Boating, fishing, waterskiing, swimming • Fish-cleaning stations • Houseboating
Rural Natural	<ul style="list-style-type: none"> • The integrity of cultural and natural resources in this area would be maintained, rehabilitated, or restored • Facilities would be located whenever possible in previously disturbed areas • Natural resources in this area may be modified to accommodate visitor activities and facilities with minimal impact on resources 	<ul style="list-style-type: none"> • Contact with other individual or groups of visitors should be expected • Visitors would have occasional contacts with park staff • There would be opportunities to learn about the park's cultural and natural resources 	<ul style="list-style-type: none"> • Boat launch sites • Boat docks • Boat fuel facilities • Fishing and scuba diving • Houseboating
Semiprimitive	<ul style="list-style-type: none"> • Naturally functioning ecosystem components and processes would be evident in this zone • The integrity of natural and cultural resources would be monitored, protected, and preserved 	<ul style="list-style-type: none"> • Visitors would have the opportunity to enjoy and appreciate a natural ecosystem with little discernible human imprint • Visitors would find challenge and adventure in this zone • Self-reliance would be important • There would be some opportunities for solitude • There would be a low probability of encountering park staff or other visitors 	<ul style="list-style-type: none"> • Recreational activities such as motorboating, kayaking, canoeing, nature viewing, rafting, and fishing would predominate • Self-guided interpretive programs
Primitive	<ul style="list-style-type: none"> • Ecosystem components and processes would be completely naturally functioning in this zone • The integrity of natural and cultural resources would be monitored, protected, and preserved 	<ul style="list-style-type: none"> • Visitors would have the opportunity to enjoy and appreciate a natural ecosystem with little discernible human imprint • Visitors would find a high potential for challenge, risk, and adventure in this zone • Self-reliance would be essential • There would be numerous opportunities for solitude and a very low probability of encountering park staff or other visitors 	<ul style="list-style-type: none"> • Minimal visitor facilities necessary for resource protection and visitor safety would be developed • Resource-based recreation activities such as kayaking, canoeing, nature viewing, rafting, and fishing would predominate • Self-guided interpretive programs

Table 2 - 2: UPLAND MANAGEMENT ZONES

Concept	Resource Conditions	Visitor Experience	Appropriate Facilities and Activities
Rural Developed	<ul style="list-style-type: none"> • Significant or sensitive cultural and natural resources would be protected to minimize impacts • Natural environment would be highly modified to accommodate visitor activities and facility development 	<ul style="list-style-type: none"> • High potential for contact with other visitors • High potential for contact with park staff • Would be able to choose from a array of recreational activities • Could anticipate a safe and controlled recreational environment • Opportunities to learn about the park's natural and cultural resources 	<ul style="list-style-type: none"> • Visitor contact facilities • Hardened campground sites • Parking for cars, boat trailers, recreational vehicles • Park staff housing • Camping, picnicking • Hunting
Rural Natural	<ul style="list-style-type: none"> • The integrity of cultural and natural resources in this area would be maintained, rehabilitated, or restored • Facilities would be located whenever possible in previously disturbed areas • Natural resources in this area may be modified to accommodate visitor activity and facilities with minimal impact on resources 	<ul style="list-style-type: none"> • Contact with other individuals or groups of visitors should be expected • Visitors would have occasional contacts with park staff • There would be opportunities to learn about the park's cultural and natural resources 	<ul style="list-style-type: none"> • Campground sites • Parking for cars, boat trailers, and recreational vehicles • Camping, fishing, hunting • Horseback riding
Semiprimitive	<ul style="list-style-type: none"> • Naturally functioning ecosystem components and processes would be evident in this zone • The integrity of natural and cultural resources would be monitored, protected, and preserved 	<ul style="list-style-type: none"> • Visitors would have the opportunity to enjoy and appreciate a more natural ecosystem with little discernible human imprint • Visitors would find challenge and adventure in this zone • Self-reliance would be important • There would be some opportunities for solitude • There would be a low probability of encountering park staff or other visitors 	<ul style="list-style-type: none"> • Limited visitor facilities such as information stations that are unobtrusive and blend with the environment could be developed • Resource-based recreational activities such as nature viewing and backcountry camping would predominate • Self-guided interpretive programs
Primitive	<ul style="list-style-type: none"> • Ecosystem components and processes would be completely naturally functioning in this zone • The integrity of natural and cultural resources would be monitored, protected, and preserved 	<ul style="list-style-type: none"> • The opportunity to enjoy and appreciate a natural ecosystem with little discernible human imprint • Visitors would find a high potential for challenge, risk, and adventure in this zone • Self-reliance would be essential • There would be numerous opportunities for solitude • There would be a very low probability of encountering park staff or other visitors 	<ul style="list-style-type: none"> • Minimal visitor facilities necessary for resource protection and visitor safety would be developed • Resource-based recreational activities such as nature viewing and backcountry camping would predominate • Self-guided interpretive programs
Pecos Culture Zone	<ul style="list-style-type: none"> • Cultural resources would be the focus of this zone and would exhibit a high degree of integrity; management would emphasize a high level of protection and preservation • Native plant and other resources would be managed to reflect the environment as it appeared before the construction of the dam and reservoir 	<ul style="list-style-type: none"> • Visitors in this zone would have opportunities to learn about and gain a deeper appreciation for the extraordinary graphic and archeological resources of the Lower Pecos River culture • There would be a medium to high probability of encountering park staff or other visitors • Visitors could learn about this culture in staff-guided groups or explore on their own or in small groups guided by park informational packets and interpretive media 	<ul style="list-style-type: none"> • Visitor information and interpretation facilities such as signs, panels, and displays; trails; and rest areas could be installed • Guided and self-directed activities would focus on learning about and gaining a deeper appreciation of the Lower Pecos culture

ALTERNATIVE A: NO-ACTION ALTERNATIVE

CONCEPT AND GENERAL MANAGEMENT STRATEGIES

This alternative consists of a continuation of current management direction and trends at Amistad National Recreation Area. It provides a baseline for comparison in evaluating the changes and impacts of the other alternatives.

The National Park Service would continue to manage the national recreation area as it has in the past, as guided by the 1987 *General Management Plan / Development Concept Plan*. Under this plan, the national recreation area would continue to follow the special mandates and servicewide mandates and policies described earlier in the “Guidance for the Planning Effort” section of this document, as staffing and budget allow.

The national recreation area would manage activities to ensure the protection and preservation of the natural environment and the area’s prehistoric and historic cultural features, including archeological sites and rock art. To ensure that these activities remained within sustainable limits, the National Park Service would continue to cooperate with the Texas Department of Parks and Wildlife on issues related to hunting and fishing within national recreation area boundaries.

As directed by the 1987 plan, existing NPS operations and visitor facilities would remain in place. The national recreation area would remain classified into the four management zones described below.

MANAGEMENT ZONES

Special Use Zone. Areas in this zone would be managed under cooperative agreements in which the interests of the National Park

Service would be secondary to those of another agency.

Within the **special use zone** would be the following three subzones:

Reservoir subzone — This subzone would include all of the recreation area except the recreation areas below the maximum water level of 1,144.3 feet above sea level.

Transportation subzone — This subzone would include the principal highways and railroads.

Utilities subzone — This subzone would include utility crossings serving non-NPS operations.

Development Zone. The development zone would encompass areas of substantial development such as buildings, campgrounds, boat launch ramps and associated roads, and access/circulation roads.

Historic Zone. The historic zone would include cultural resource sites that are recommended for preservation management.

Natural Zone. Designated areas above 1,144.3 feet that are not developed for other recreational uses would be included in the natural zone. Recreational uses such as hunting would be allowed in this zone.

BORDER SECURITY

The National Park Service would retain existing relations with appropriate federal, state, and local agencies on national security.

NATURAL RESOURCE MANAGEMENT

Amistad National Recreation Area would continue to manage the national recreation area's natural resources as directed by its resource management plan. Natural ecological processes would continue to be allowed to occur, and restoration programs would continue to be initiated where necessary. The staff would continue the existing programs to preserve and protect threatened and endangered species, protect wildlife habitat, control or eradicate exotic species, and control trespass grazing. The National Park Service would work cooperatively with the Texas Department of Parks and Wildlife to manage fishing tournaments and recreational fishing and hunting to ensure that these activities would remain at sustainable levels. The national recreation area also would work cooperatively with federal, state, and local agencies and private organizations to maintain water quality standards at Lake Amistad.

CULTURAL RESOURCE MANAGEMENT

The National Park Service would continue the existing programs for the protection and preservation of the national recreation area's archeological resources, including archeological sites, artifacts, and rock art, as directed by the area's resource management plan. Archeological sites would be interpreted at three sites now open to visitor access. Amistad National Recreation Area would continue to cooperate with Seminole Canyon State Park and Historical Site, the Rock Art Foundation, and the Shumla School on cultural resource protection and on educational and interpretive programs.

VISITOR USE AND EXPERIENCE

The national recreation area would continue to provide for existing recreational uses, including boating, fishing, swimming, camping, picnicking, scuba diving, and hunting. New recreational uses would be accommodated if and when they were compatible with existing uses and would be within staff capabilities. Some areas especially adapted for certain uses would continue to be set aside for certain uses such as scuba diving, archeological preservation, and boat-in camping. Upstream canyons still would serve as settings for lower-density use oriented to a degree of solitude. Uses such as fishing, boat-in camping, photography, and appreciation of cultural, natural, and scenic resource values would predominate.

The existing interpretive and educational programs would continue under the no-action alternative. These would include the current outreach programs for local schools, the Schools in Parks program, interpretive programs on AMTRAK, and cooperative programs with Seminole Canyon State Historical Park and Historical Site. Efforts to develop private boat tours to make the reservoir more accessible to the non-boating public would continue. Additional informational signs would be developed as needs were identified.

NPS OPERATIONS, FACILITIES, AND DEVELOPMENT

Under the no-action alternative, no improvements would be made to the existing visitor facilities. Some improvements might be made to improve visitor access.

No new construction would be authorized except for some modifications to the infrastructure at boat launch sites to respond to fluctuating lake levels. A diverse range of visitor use facilities from primitive to drive-in campsites, primitive trails to boardwalks, unpaved to paved roads, and self directed interpretation to ranger-led programs would continue to be



available. The NPS headquarters would remain in its current location, and the national recreation area's visitor information center would remain in the leased facilities on U. S. Highway 90, 5.5 miles west of the headquarters building.

CONCESSION OPERATIONS

Concession operations would remain at their current levels, except that the concession operations at Box Canyon would be expanded. The facilities at Box Canyon were improved under a 1999 amendment to the previous general management plan. These improvements included a boat ramp providing launch capability at low water levels, expanded parking, and restroom facilities above the conservation pool level of 1,117 feet mean sea level. Forever Resorts would move its operations to Box Canyon.

CONSERVATION EASEMENTS

No conservation easements would be developed under the no-action alternative.

ESTIMATED COSTS

The following costs are given for comparison between alternatives and are not to be used for budgeting purposes. Costs are in FY 2006 dollars.

There would be no construction improvements under the no-action alternative.

Annual maintenance and operating costs, including maintenance, operations, and personnel, would range between \$3.8 million and \$4 million.

Total life cycle costs over a 25-year period would range between \$44 and 48 million.

ALTERNATIVE B: PREFERRED ALTERNATIVE

CONCEPT

Amistad's distinctive combination of cultural and natural resources and its variety of outstanding water-based and land-based recreational opportunities make it a unique recreational and educational opportunity in southwest Texas. Amistad is a resource of which all Americans, and particularly the residents of southwest Texas, can be justly proud. More than a mere recreation area, Amistad has the potential to serve as an outdoor classroom in which visitors gain a deeper appreciation for the history, cultures, and natural environment of the Lower Pecos River valley and the Rio Grande borderlands.

However, to realize this vision for the future, Amistad must successfully address challenges relating to safety and security, resource management, education and interpretation, and cooperation with a number of federal, state, and local agencies and officials, private organizations, neighbors, and other stakeholders. Alternative B would be implemented according to the procedures through which the National Park Service and the management and staff of Amistad National Recreation Area would realize the full potential of the area for this and future generations.

Amistad — A Dynamic Resource

Lake Amistad serves as a vital component of flood control and irrigation management in the Lower Rio Grande valley. The unpredictability of inflows and downstream demands for the water stored in the reservoir combines with the extremely variable weather conditions of southwestern Texas to make Amistad's water levels subject to substantial fluctuations, often as much as 15–20 vertical feet in relatively stable years, more in years of drought or unusually heavy precipitation.

Land and lake conditions at Amistad National Recreation Area vary significantly in periods of low, medium, and high water levels. The management and staff of the national recreation area essentially are managing not one static reservoir, but rather a dynamic resource whose physical character can change dramatically from season to season. This alternative was developed with recognition of the need for flexible management that can respond to changing conditions resulting from the fluctuations in lake levels.

Del Rio — The Gateway Community

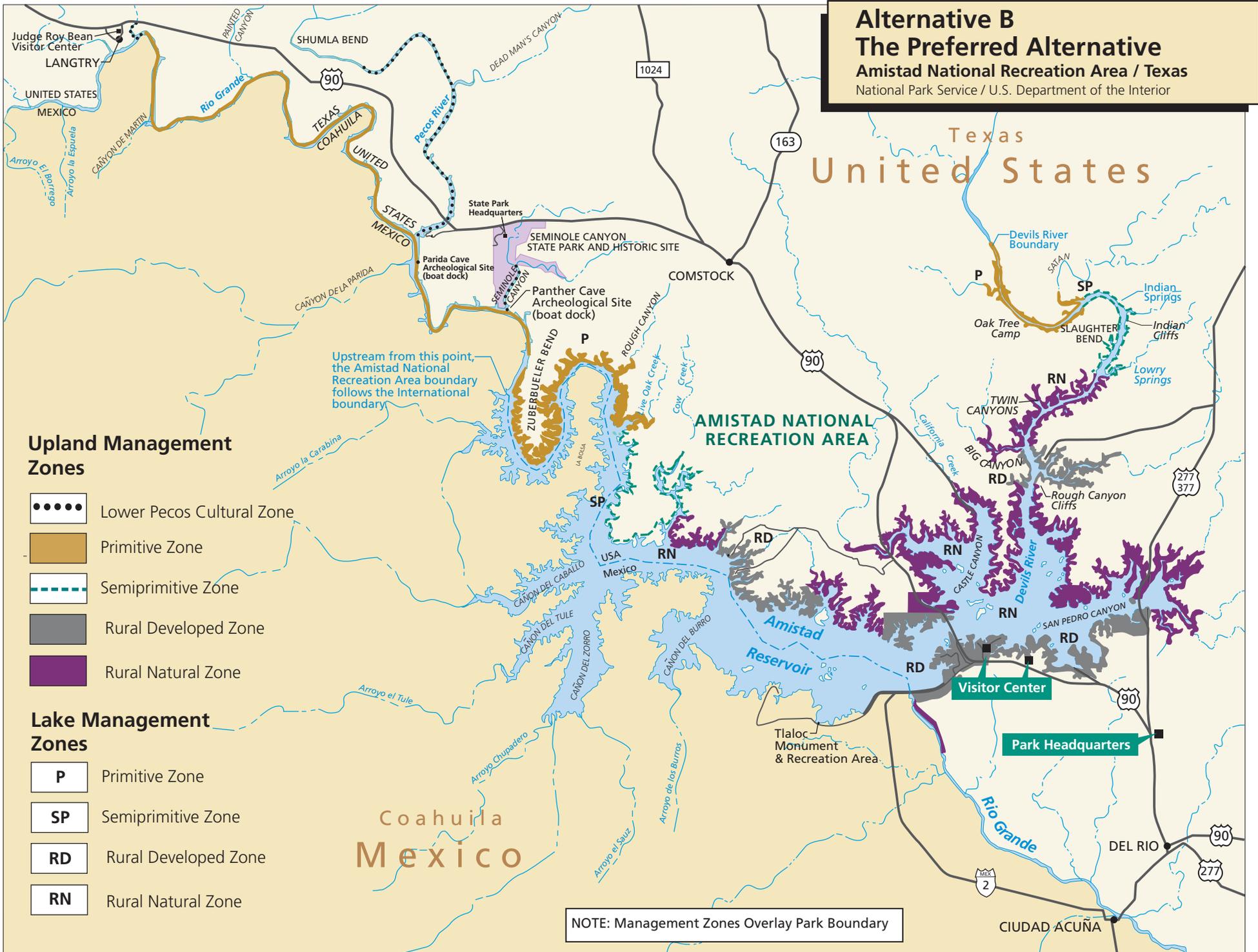
Gateway communities are cities and towns that border large public land holdings such as national and state parks, forests, or wildlife refuges. The city of Del Rio, southeast of Amistad National Recreation Area, functions as the gateway community for the national recreation area. Amistad plays a significant role in the economic life of Del Rio as a major tourist attraction and the single most important recreational resource for residents of the region.

Del Rio's civic leaders and NPS managers have a shared interest in planning for and managing the challenges presented by regional growth, community development, and improvements in the transportation infrastructure and in protecting and preserving cultural and natural resources.

Alternative B would involve cooperative planning and partnership between the National Park Service and the city of Del Rio to preserve the resources of Amistad National Recreation Area as an important component of Del Rio's future economic and community development.

The text below describes how the national recreation area would address major issues

Alternative B
The Preferred Alternative
 Amistad National Recreation Area / Texas
 National Park Service / U.S. Department of the Interior



Upland Management Zones

-  Lower Pecos Cultural Zone
-  Primitive Zone
-  Semiprimitive Zone
-  Rural Developed Zone
-  Rural Natural Zone

Lake Management Zones

-  Primitive Zone
-  Semiprimitive Zone
-  Rural Developed Zone
-  Rural Natural Zone

NOTE: Management Zones Overlay Park Boundary

relating to security, recreational activities, protecting and managing cultural and natural resources, educational and interpretive programs, and the development of facilities, including visitor access.

BORDER SECURITY

As part of this planning effort, the Intermountain Regional office of the National Park Service would spearhead the development of a coordinated border management and security strategy for all NPS units on the U.S.–Mexico border in Texas. In addition to Amistad, other NPS border units in Texas are Chamizal National Memorial, Big Bend National Park, Rio Grande Wild and Scenic River, Palo Alto Battlefield National Historic Site, and Padre Island National Seashore. The national recreation area would coordinate with the NPS Intermountain Region to develop this multi-park strategy. The National Park Service also would work with the Department of Homeland Security to offer technical assistance to the border parks in developing this cooperative strategy.

As issues related to border security were resolved, the NPS Texas border strategy could be broadened to address other issues specific to the U.S.–Mexico border region. The Texas Council on Environmental Quality (formerly the Texas Natural Resource Conservation Commission) monitors environmental issues and enforces environmental law and policy throughout Texas, including the border area where four Mexican states border Texas. Among the issues facing the border region are increasing scarcity of hydrological resources, rapid population growth and urban development, industrialization, immigration, and cross-border trade. A range of environmental impacts relating to hazardous waste, declining quality of air and water, and other natural resource degradation have been identified as a result of these issues. The NPS border strategy eventually could evolve to help the National

Park Service coordinate more effectively with the state of Texas in addressing these issues.

NATURAL RESOURCE PROTECTION AND MANAGEMENT

The construction of the Amistad dam and the creation of Lake Amistad fundamentally altered this part of the Rio Grande landscape, over time creating a new and different environment. The staff of Amistad is charged with managing the use of the new environment while preserving the remaining elements of the old. The fact that this new environment changes according to the fluctuating levels of Lake Amistad adds to the management challenge.

Some plants and animals found in the national recreation area are nonnative species that are a significant challenge to manage. Exotic species can consume scarce resources, push out native species, and ultimately substantially alter the environment.

Several of these exotic species, like nutria and hydrilla, are limited to areas near the reservoir. However, aoudad sheep, mouflon sheep, and tamarisk affect a far larger area. The spread of tamarisk, in particular, represents an increasingly critical regional environmental crisis. This noxious plant species, which is spreading rapidly in riparian areas throughout the West, is encroaching in the Pecos, Devils, and Rio Grande watersheds. The national recreation area would work cooperatively with Texas State Parks and Wildlife, The Texas Commission on Environmental Quality, the Nature Conservancy, and private landowners to develop and implement a comprehensive program of tamarisk eradication in the Pecos, Devils, and Rio Grande valleys. Cooperative planning also would be essential in development strategies to manage other exotic species effectively. These management strategies would be designed for maximum effectiveness at low, medium, and high water levels.

Several threatened or endangered species or species of concern have been confirmed either in or in the near vicinity of Amistad.

The National Park Service and Amistad management would work with the U.S. Fish and Wildlife Service, the Texas Commission on Environmental Quality, and Texas Parks and Wildlife to develop strategies to protect critical habitat for threatened or endangered species and species of concern and to manage recreation to ensure the sustainability of these species.

The resource management plan would be updated and amended to provide additional guidance for specific resource management initiatives. That plan would be amended after the implementation of servicewide guidelines on resource management.

CULTURAL RESOURCE PROTECTION AND MANAGEMENT

Archeological Resources and Rock Art

The region's dry climate fosters a high level of integrity of the area's prehistoric material culture, including the abundant rock art and national register-listed archeological sites. Some elements of this material culture, such as preserved fiber materials, are unknown in other parts of North America.

Protecting and managing these resources is a critical element of the national recreation area's legislative mandate. Protecting them involves maintaining their integrity for future generations. Their protection depends on ensuring that today's visitors understand and appreciate the sensitive nature of the archeological resources and are enlisted as partners in preserving them. In cooperation with visitors, area schools, community groups, other government agencies, private organizations, and the general public, Amistad National Recreation Area can succeed in promoting a conservation ethic that would help ensure that

these vivid reminders of the history of the Lower Rio Grande valley will be carried forward unimpaired into the future. An archeologist would be added to the staff to enhance the national recreation area's ability to implement and monitor resource protection programs, archeological resource surveys, and partnerships with state and local agencies and organizations.

The National Park Service would coordinate in partnership with Seminole Canyon State Park and Historic Site, the Shumla School, the Rock Art Foundation, the Whitehead Museum, and the Del Rio Independent School District in the development of expanded interpretive and educational programs. Under a cooperative agreement, the state of Texas would provide the facility for the expanded programs, and the national recreation area would offer technical assistance in interpretive planning and exhibit design. Working together to expand educational services, the state and the National Park Service could better inform visitors about the region's rich history and culture.

Fluctuating water levels affect access to some archeological sites. Although some sites may be inaccessible during periods of high water, others, such as Parida and Panther Caves, are most easily accessed during high water. The national recreation area would manage cultural resource programs to increase visitor access to archeological sites in all water level conditions. Improvements to boat docks, trails, stairs, and wayside exhibits would enhance visitor access to and enjoyment of these sites. Removing dead brush and trimming live vegetation would improve access to Parida Cave. The transportation study for Amistad would identify potential improvements of access to cultural resources (see later "NPS Operations, Facilities, and Development" section).

To avert adverse impacts, fencing or other physical protection measures would be installed in areas where archeological sites are

threatened by trespass livestock. Other protection measures such as motion sensors, surveillance cameras, and increased law enforcement patrols would be used to augment the protection of highly significant and fragile archeological and rock art sites.

A number of significant archeological and other cultural resources within the boundaries of Amistad National Recreation Area are not owned by the National Park Service. Through its partnership with the Rock Art Foundation and the Shumla School, the NPS would work with owners of private property within the boundaries of the national recreation area to develop appropriate protection strategies for the significant resources that are not in NPS jurisdiction. If landowners were willing to allow public access to their resources, the national recreation area would work to develop cooperative agreements or acquire conservation easements to protect resources and adequately compensate participating landowners. The National Park Service would seek to acquire lands with significant resources only where there was a willing seller.

Museum Collections

Amistad's museum collection, which contains artifacts from more than 200 sites and 22 major excavations, is estimated to comprise more than 1.4 million artifacts and objects. These artifacts are invaluable storytelling tools for informing school groups, researchers, and other visitors of the long, diverse cultural history of the Lower Pecos and Rio Grande valleys. The National Park Service would develop a new curatorial facility to maintain, exhibit, and interpret this collection, and the staff would work to expand exhibit programs that would facilitate greater visitor enjoyment and appreciation of the collection. A museum curator would be added to the Education and Resources Management Division as recommended by the national recreation area's "Collections Management Plan" to

oversee the management and protection of the Amistad's collection.

VISITOR USE AND EXPERIENCE

Visitor education and interpretive programs are the tools that would be used to realize fully Amistad's potential as an outdoor classroom in which visitors could gain a deeper appreciation for the history, cultures, and natural environment of the Lower Pecos River valley and the Rio Grande borderlands. A number of existing NPS programs described below would be expanded to create meaningful experiences for visitors of all ages and backgrounds to enhance their visit to Amistad. Interpretive and educational programs would be integrated into the wide variety of recreational activities.

Recreational Activities

Under this alternative, opportunities for all recreational activities would be retained or expanded. In some cases, variations in the water level would determine the level and extent of recreational uses. For example, there would be more opportunities for land-based activities such as hunting, hiking, and camping in some parts of the national recreation area during periods of low water (1,075 feet and below). Because the available land areas for hunting would be larger during low water, national recreation area managers could consider expanding hunting opportunities to include limited hunting with low-velocity traditional firearms.

Final decisions about this activity would be made in consultation with the Texas Parks and Wildlife Department. Implementing these decisions would be deferred until the revision of the national recreation area's resource management plan, which would describe the specific strategies for managing hunting.

Educational and interpretive opportunities such as experiencing the national recreation area's archeological resources would be enhanced in some areas during low water periods by improving access to cultural sites.

At times when water levels were in the middle range (1,076–1,109 feet), the most diverse mix of land- and water-based visitor activities would be available, including fishing, boating, hunting, hiking, and enjoying archeological resources.

In periods of high water (1,110–1,117 feet), when visitation to the reservoir would be correspondingly higher, there would be more opportunities for water-based activities such as fishing, power and nonmotorized boating, shoreline fishing, swimming, and scuba diving. High water levels provide better access to shoreline activities and more water surface for boating and fishing. The managers of the national recreation area would work to ensure that access points to the reservoir were available to users.

In all cases, Amistad National Recreation Area management would focus on making available visitor opportunities and experiences that would be most appropriate to the existing water levels.

To enhance and expand recreational opportunities, the existing facilities would be improved. (See later “NPS Operations, Facilities and Development” for more information about these improvements.)

Connecting People to Parks

“Connecting People to Parks” is the theme of the NPS Interpretation and Education Division. By connecting people to parks, educational and interpretive programs would create memorable visitor experiences, preserve our diverse heritage, and promote resource stewardship. These programs would be a means of telling visitors about the remark-

able combination of resources and experiences that make Amistad one of the special places in southwest Texas. These programs would communicate the need to preserve Amistad and the important role that visitors, neighbors, and local residents can play in helping protect the national recreation area for the enjoyment of future generations. The National Park Service has developed a number of programs that could be implemented to increase public awareness of and support for Amistad National Recreation Area.

Parks as Classrooms

The “Parks as Classrooms” program is a curriculum-based education program of the National Park Service. It is specifically designed to help teachers meet their curriculum needs through the resources found at national park system units. Based on the idea that parks represent the real thing in the right place, Parks as Classrooms uses the natural, cultural, and historical resources of park system units to offer free or at-cost opportunities to supplement classroom instruction. The programs, which are interdisciplinary and emphasize experiential teaching and learning techniques, are offered in collaboration with local school districts and community organizations.

The resource and interpretive staffs of Amistad National Recreation Area would work with schools in the Del Rio community, Val Verde County, and Seminole Canyon State Park and Historic Site to design curricula and programs focused on illustrating the variety of resources and the distinct ecosystem at Amistad. The NPS Education Council report, “Renewing Our Education Mission,” would provide the overall framework for the educational programs. Visiting students would enjoy a range of experiences to supplement their regular curriculum.

Cooperative Efforts

The National Park Service would cooperate with Texas State Parks and Wildlife, the Nature Conservancy, the Rock Art Foundation, the Shumla School, and the Del Rio School District and other federal, state, and local agencies and organizations to develop education programs and ensure that these programs would reflect a comprehensive interdisciplinary approach to learning.

Cooperating Associations

Cooperating associations are one of the oldest and most enduring kinds of partnership for the National Park Service. Since 1920, these associations have offered visitors inexpensive, high-quality guides, maps, and other interpretive material and literature not available through the use of federal funds. Wide-ranging partnerships of interested individuals, educational institutions, and preservation societies have joined with NPS naturalists, historians, and interpreters to produce and make available such information.

NPS managers would work closely with the cooperating association for Amistad National Recreation Area to offer visitors and members of the local community information about the national recreation area, to develop effective educational materials, and to tie Amistad closer to Del Rio and the surrounding region.

Volunteers in Parks

The Volunteers in Parks (VIP) program has grown significantly since its inception in 1970. Today nearly 120,000 volunteers help to preserve and protect our natural and cultural resources in units of the national park system. The program is an invaluable tool for bringing many people of different ages, backgrounds, skills, and talents to devote their time and energy to enriching our national park system units.

The national recreation area would work closely with its VIPs to increase their contributions and expand the program to build a close relationship between the national recreation area, the people who use it, and the local community.

Junior Ranger Program

The Junior Ranger program is designed to introduce young people from the ages of 7 to 11 to the national park system units. Involving children from Del Rio and the surrounding community in the Junior Ranger program is another way of engaging them in activities at Amistad and raising community awareness of this important resource. NPS staff would work to develop an active Junior Ranger program. The participation of local school-children at Amistad would help ensure a high-quality experience at Amistad in the future.

NPS OPERATIONS, FACILITIES, AND DEVELOPMENT

Additions and improvement to Amistad's existing infrastructure would be necessary to improve security, meet the NPS commitments to homeland security, protect the resources better, and expand visitor education and interpretation.

Under the preferred alternative, a new visitor and administrative facility would be developed at Diablo East. This new facility would enhance efficiency and effectiveness, allowing the staff to provide more services for visitors. This would also include maintenance operations. New maintenance facilities would enable the national recreation area to meet current federal and state regulatory requirements, ensure employee safety, and improve operational efficiency. An educational pavilion for hosting field-based educational programs would also be constructed here. NPS managers would also consider relocating

the amphitheater at Governor’s Landing to Diablo East.

A small curatorial storage facility would be constructed as part of the new administrative facility to provide appropriate on-site storage for artifacts in the national recreation area’s museum collection. The main collection would remain at the University of Texas at Austin.

In addition, a new law enforcement facility would be developed at Diablo East and a ranger station at Box Canyon. These facilities would enable the law enforcement ranger division to:

- Enhance visitor and NPS employee safety;
- Fully comply with NPS training requirements for law enforcement skills and physical tactics;
- Comply with Health and Fitness Guidelines
- Comply with guidelines for managing and storing evidence, contraband and detaining prisoners;
- Improve emergency operations and communication.

The construction of the new administration, visitor, and maintenance facility and the new law enforcement facility would enable the national recreation area to demolish or remove other buildings from the facility inventory, including the current NPS headquarters facility, the visitor information center and maintenance facility, and the modular ranger station at Diablo East.

NPS staff would also undertake improvements to make the lake and its surrounding lands more accessible for visitors. These improvements to expand visitors’ appreciation and enjoyment of Amistad National Recreation Area would include the following improvements to the infrastructure.

- Extend boat launch ramps during periods of low water. Improvements to boat

launch sites at U.S. Highway 277 North and Spur 406 would help distribute visitor use in periods of high demand.

- Improve and expand camping opportunities at Diablo East, Rough Canyon, Governor’s Landing, U.S. 277 North, and San Pedro/ Spur 454. Improve campsites at Spur 406 to expand camping opportunities during periods of high water. Improvements could include hardened surfaces, pull-throughs, grills, and electrical power hookups for recreational vehicles.
- Improve access roads at Spur 454.
- Improve security at Governor’s Landing with controlled nighttime access and at San Pedro/Spur 454 with the closure of social roads.
- Improve signs and visitor information and interpretation at Diablo East, Black Brush Point, San Pedro/Spur 454, U.S. 277 South, and Rough Canyon.
- Improve internal road system and close “social” roads that are not incorporated in internal circulation system.
- Develop more paved parking at Diablo East.
- Develop additional parking at U.S. 277 South and Spur 406.
- Develop a trail between Diablo East and Black Brush Point for access during low and medium water levels and trails in the upland areas around Diablo East. Develop trails, including interpretive trails, at Rough Canyon and Pecos.
- Develop biking and equestrian trails at Spur 454.
- Expand facilities at San Pedro/Spur 454 to accommodate more local users.
- Allow for scuba concessions at Diablo East.
- Improve swim beaches at Rough Canyon.

- Improve/expand picnicking sites at U.S. 277 South.
- Add more fish-cleaning stations

A floating fish weigh-in station would be developed for tournaments to lessen mortality rates of fish caught and released after competition.

Some of these actions, such as improving boat ramps, campgrounds, and trails, would be undertaken during low-water periods (1,060 feet). Additional campsites developed for use in low water periods could be managed and maintained by concession services.

Other developments could include the following:

- transportation services for the nonboating public (such as houseboat cruises), access to cultural resource sites, and transport for nonmotorized boaters to the Pecos and Devil's Rivers and the Upper Rio Grande.
- improved communication and security facilities such as ranger stations and emergency telephones

As communications technology improves in the future, more systems for informing visitors about safety, weather conditions, tournaments, special programs, and other information would be developed.

Implementation of the recommendations of the transportation planning study conducted as part of the general management plan would facilitate visitor access and circulation throughout the national recreation area.

The National Park Service would continue to improve the facilities at the Rio Grande-Box Canyon area according to the 1999 *General Management Plan Amendment* for Amistad National Recreation Area.

Under the terms of an agreement with the United States Coast Guard Amistad National

Recreation Area is responsible for installing and maintaining aids to navigation (marker buoys) in the navigable waters of Lake Amistad. The Coast Guard provides materials for the marker buoys; the National Park Service is responsible for providing labor, fuel, and boat use for installing and maintaining the buoys. Under this alternative, Amistad would work with the Coast Guard to update the existing agreement to ensure that the terms of the agreement are equitable.

As part of the general management planning process, the national recreation area is conducting an alternative transportation study to identify areas in which access and transportation can be improved to allow greater visitor enjoyment of the lake and uplands. This will include evaluating potential improvements at boat launch sites to provide maximum use during periods of low water.

CONCESSION OPERATIONS

To realize fully the recreational potential of Amistad National Recreation Area, alternative B would involve more use of concession services to offer or enhance safe and enjoyable visitor experiences related to the natural and cultural resources at Amistad. The increases in visitation that occur during periods of high water would lead to proportionally greater reliance on concession operations to serve visitors during these periods. More use of concession services would enable the staff to focus on visitor safety, resource protection, and the development of expanded interpretation and educational programs. This would include activities such as scuba diving, canoeing, and kayaking.

CONSERVATION EASEMENTS

The national recreation area staff would work with local landowners to obtain conservation easements or other cooperative agreements that could give people using nonmotorized

boating better access to the Pecos and Devils Rivers and the upper Rio Grande. These agreements with landowners would allow limited shore access for canoeists, kayakers, and rafters on the tributaries.

ESTIMATED COSTS

The following costs are given for comparison between alternatives and are not to be used for budgeting purposes. Costs are in FY 2006 dollars.

It is estimated that construction improvements under the preferred alternative would range between \$8 million and \$9 million. These figures include construction of the visitor center and law enforcement center.

Annual maintenance and operating costs, including maintenance, operations, and personnel, would range between \$4 million and \$4.25 million.

Total life cycle costs over a 25-year period would range between \$53 million and \$56 million.

USER CAPACITY AND INDICATORS AND STANDARDS

User capacity, once referred to as visitor carrying capacity, came to the forefront of public land planning in the 1970s. The 1978 National Parks and Recreation Act called for public land planning efforts to address user capacities to ensure adequate protection of the natural and cultural resources and the quality of the visitor experience in national park system units. Although many people think of a capacity as a number of people in a given area, the concept is more complex than that. Research has shown that user capacity cannot be measured simply as a number of people, because impacts on desired resource conditions and visitor experiences are often related to a variety of factors that may include the number of people, the types of activities that people engage in, where they go, what kind of footprints they leave behind, what type of resources are in the area, and the level of management presence.

In 1992 the Park Service began developing the Visitor Experience and Resource Protection (VERP) framework to address user capacities for units of the national park system. The VERP framework is focused on measuring the Park Service's success at achieving desired resource and social conditions as they relate to visitor use. Instead of solely tracking and controlling user numbers, the focus of this method is monitoring and controlling the overall condition of resources and the quality of the visitor experience. Actions taken as a result of monitoring impacts on resources and visitor experiences will include management of visitor use levels, types, behaviors, patterns, and other public uses as needed to achieve the desired conditions. The monitoring component of the VERP process helps test the effectiveness of management actions and provides a basis for informed adaptive management of visitor use.

The first major step of the VERP process is defining desired resource conditions, visitor opportunities, and general levels of development and management for national park system areas. The second step is defining indicators and standards related to visitor use that will be monitored, and the general range of actions that could be taken if NPS staff is seeing impacts on resources or visitor experience that exceeds acceptable levels.

An indicator is a measurable variable that can be used to track changes in conditions related to human activity, so that progress towards desired conditions can be assessed. A standard is the management decision about the minimum allowable condition for an indicator. Examples of an indicator and standard are as follows:

Indicator: The waiting period required to see an attraction during peak use days.

Standard: No more than 10% of visitors wait 10 or more minutes to see an attraction.

The last steps of visitor capacity decision making, which continue indefinitely, are monitoring the park unit's indicators and standards and taking management actions to minimize impacts when needed. The results of the monitoring efforts, related visitor use management actions, and any changes to the indicators and standards will need to be available for public review. In summary, the VERP process serves as a regular report card, informing the public about the status of desired conditions, as well as the management actions being taken to protect and enhance them.

Prescriptions for desired conditions and management actions needed to maintain those desired conditions have been part of general management planning for some time.

Until 2005, selecting indicators and standards had been deferred to subsequent implementation planning. Today's general management plans include indicators and standards, but clearly state that modification of indicators may occur based on new information regarding the effectiveness of those indicators and standards. Today's general management plans also include a commitment to monitor the selected indicators. The level of rigor for monitoring may vary from indicator to indicator depending on how close existing conditions are to standards.

In a general management plan, the entire park system unit is being addressed

regarding desired conditions and potential management strategies. In selecting indicators at this level, the focus should be on addressing the most relevant and serious impacts from human use activities. Other indicators may be considered at a later date in other planning efforts that are more detailed for particular areas or topics in the park system unit (e.g., wilderness plans, trails plans, etc.).

The following table presents the indicators and standards for Amistad National Recreation Area.

TABLE 3: INDICATORS AND STANDARDS FOR AMISTAD NATIONAL RECREATION AREA

Topic	Indicator	Standard (could be varied by management zone or all zones the same)	Monitoring Examples	Management Examples
Damage to cultural resources	<p>1. Number of social trails leading to, through, and from site</p> <p>2. General damage or defacement of artifacts, rock art, and exposed surface archeological sites not caused by natural forces</p>	<p>1. One undesignated trail leading to a resource site</p> <p>2. No artifacts, rock art, or exposed surface archeological sites with evidence of damage or defacement</p>	<p>1. Counts of social trails at a percentage of sites within each management zone</p> <p>Counts of social trails at all sites within each management zone</p> <p>2. Quantify the evidence for attempts to remove or vandalize rock art, artifacts, and surface occurring archeological deposits</p>	<p>Increase educational efforts and revise visitor handouts to make people aware of how certain activities cause damage.</p> <p>Institute regular resource management staff monitoring patrols.</p> <p>Provide regular guided tours to site (requires staff presence).</p> <p>Build physical barriers to reduce or channel access to site from lake, trail, or public view point (e.g., fence, rock wall, and shrubs).</p> <p>Increase number of high visibility ranger boat patrols in locales with highest percentage of new damage.</p> <p>Limit number of people actually within site boundaries (requires staff presence).</p> <p>Close site to all public use.</p>
Damage at campgrounds/ suitable camping areas in the backcountry	<p>Number of visitor-created pit toilets within designated campgrounds/ suitable camping areas. (Definition of visitor-created pit toilet – a hole dug and possibly reburied that was used to hold human waste.)</p>	<p>No visitor-created pit toilets within designated campgrounds and three visitor-created pit toilets per acre of camping areas outside of designated campgrounds</p>	<p>Count number of visitor-created pit toilets</p>	<p>Increase educational efforts.</p> <p>Increase number/location of restroom facilities within designated campgrounds.</p> <p>Create designated backcountry campgrounds with vault toilets.</p> <p>Limit number of campers at each campsite in backcountry.</p> <p>Limit number of campsites at certain areas in backcountry.</p> <p>Limit total number of backcountry campers.</p> <p>Close areas in backcountry to camping.</p>

Topic	Indicator	Standard (could be varied by management zone or all zones the same)	Monitoring Examples	Management Examples
"Social" Roads – <i>(Definition of social road is anything that looks like it has been used for motorized travel and is not part of designated road system.)</i>	1. Total length in miles of all social roads 2. Number of social roads branching off from designated road system	1. One mile for every 10 feet the reservoir drops below 1,117 feet 2. Five intersections (off-shoots) with designated roads for every 10 feet the reservoir drops below 1,117 feet	1. Measure length of all social roads in miles 2. Count number of off-shoots from designated roads	Increase education. Clearly delineate designated roads with signs. Determine if social road leads to site that should have a designated road. Increase enforcement patrols/block social roads. Limit/permit activities that are creating most of the social road (i.e., dispersed camping, bank fishing).
Noise levels/soundscape – <i>(NPS noise regulations require that boats be no louder than 82 dBA @ 82 feet. Other audio devices may not exceed 60 dBA @ 50 feet (36 CFR: 48 FR 30275, June 30, 1983; as amended by 61 FR 46556, Sept. 4, 1996.)</i>	Percent time above natural ambient sound levels	Rural Developed: 50–100% of time above natural ambient sound levels. Rural Natural: 20–50% of time above natural ambient sound levels. Semiprimitive: 10–20% of time above natural ambient sound levels. Primitive: 5–10% of time above natural ambient sound levels.	Set up listening stations for a period of time (e.g., over two week days and two weekend days)	Increase educational efforts about how noise output varies with speed and how noise affects wildlife/visitor experience. Limit size of engine allowed within each management zone. Prohibit engines from running above certain speeds. Reduce number of boats permitted within each zone.
Least tern nesting sites	Number of people/boats breaching nesting grounds	One (1) person or boat seen or evidence thereof within nesting grounds (e.g., footprints, boat drag marks not made by staff).	Regular patrols observing nesting sites. Special patrols/monitoring activities at more frequent intervals/varied times.	Increased informational signs. Increased educational efforts. Increased enforcement.

Topic	Indicator	Standard (could be varied by management zone or all zones the same)	Monitoring Examples	Management Examples
Boating capacity	Number of boats per acre of water surface	Rural Developed: Average of 25-35 acres/boat within zone Rural Natural: Average of 60-80 acres/boat within zone Semiprimitive: Average of 200-295 acres/boat within zone Primitive: Average of 600-1840 acres/boat within zone <i>Areas around boat launches and marinas are exempt</i>	Counting number of daily permits issued. Random sampling of boat densities in different zones.	Increasing educational efforts about permitting system and how to apply. Issuing additional permits as people remove boats from the lake for the day.
Boat launches/ramps	Length of time each boat must wait from arrival at launch until launch is available for their use	10 minutes spent waiting by visitors not exceeded 10% of the time. Exemptions to standard – 30 minutes past end of fishing tournament at launch sites available for tournament use	Clock wait times	Increased management of ramps by NPS staff/volunteers/tournament officials. Build more ramps. Increased restrictions on ramps available for tournament use.

MITIGATIVE MEASURES FOR THE ACTION ALTERNATIVE

Congress has charged the National Park Service with managing the lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS Organic Act, 16 USC 1). As a result, the National Park Service routinely evaluates and implements mitigation whenever conditions occur that could adversely affect the sustainability of national park system resources.

To ensure that the implementation of the action alternative will protect unimpaired natural and cultural resources and the quality of the visitor experience, a consistent set of mitigating measures would be applied to actions proposed in this plan. The National Park Service would prepare appropriate environmental reviews (those required by the National Environmental Policy Act, the National Historic Preservation Act, and other relevant legislation) for these future actions. As part of the environmental review, the National Park Service would avoid, minimize, and mitigate adverse impacts when practicable. Implementing a compliance-monitoring program could be considered to be within the parameters of the National Environmental Policy Act and the National Historic Preservation Act compliance documents and U.S. Army Corps of Engineers Section 404 permits. The compliance monitoring program would oversee these mitigating measures and would include reporting protocols.

The following mitigating measures and best management practices would be applied to avoid or minimize the potential impacts from implementing the alternatives. These measures would apply to all alternatives.

NATURAL RESOURCES

Air Quality

The National Park Service would implement a dust abatement program. Standard dust abatement measures could include the following elements: watering or otherwise stabilizing soils, covering haul trucks, enforcing speed limits on unpaved roads, minimizing vegetation clearing, and revegetating areas after construction. The National Park Service would take actions to mitigate short-term adverse impacts arising from the construction of new facilities such as the visitor center and law enforcement facility.

Consistent with NPS management policies, the National Park Service would also work with federal, state, and local partners to develop strategies to reduce impacts on air quality related to the long-range transport of air pollutants and increased development in the region.

Exotic Plant Species

The national recreation area would implement a noxious weed abatement program. Standard measures could include the following elements: ensuring that construction-related equipment arrives on the site free of mud or seed-bearing material, certifying all seeds and straw material as weed-free, identifying areas of noxious weeds before construction, treating noxious weeds or noxious weed topsoil before construction (segregating topsoil, storage, herbicide treatment), and revegetating with appropriate native species.

Exotic Animal Species

The national recreation area would initiate programs to manage exotic animal species,

including eradication where necessary. Priority would be given to managing species that cause or potentially could cause significant impacts on the resources and that reasonably could be successfully controlled (see “Grazing” in chapter 1, p. 11, for more information on this topic).

Soils

New facilities would be placed on soils suitable for development. In construction areas, soil erosion would be minimized by limiting the time that soil was left exposed and by applying other erosion control measures such as erosion matting, silt fencing, and sedimentation basins (which would reduce erosion, surface scouring, and discharge to water bodies). After work was finished, the construction areas would be revegetated with native plants in a timely period.

Threatened or Endangered Species and Species of Concern

Mitigative actions would be carried out during normal operations and before, during, and after construction to minimize immediate and long-term impacts on rare, threatened, and endangered species. These actions would vary by the specific project and by the affected part of the national recreation area. Many of the measures listed below for vegetation and wildlife also would benefit rare, threatened, and endangered species by helping to preserve habitat. Mitigating actions specific to rare, threatened, and endangered species would include the following:

- Conduct surveys for rare, threatened, and endangered species as warranted.
- Site and design facilities and actions to avoid adverse effects on rare, threatened, and endangered species. If avoidance is infeasible, minimize and compensate adverse effects on rare, threatened, and endangered species as appropriate and in

consultation with the appropriate resource agencies.

- Develop and implement restoration or monitoring plans as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- Implement measures to reduce the adverse effects on rare, threatened, and endangered species caused by nonnative plants and wildlife.

Vegetation

Areas used by visitors (such as trails) would be monitored for signs that native vegetation was being disturbed. The national recreation area would use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or social trailing.

Revegetation plans for disturbed areas would be required, as would the use of native species. Revegetation plans should specify the seed/plant source, seed/plant mixes, and soil preparation. Salvage vegetation would be used to the extent possible.

Water Resources

To prevent water pollution during construction, the national recreation area would use erosion control measures, minimize discharge to water bodies, and regularly inspect construction equipment for leaks of petroleum and other chemicals.

A runoff filtration system would be built to minimize water pollution from parking areas.

Wildlife

Techniques used to reduce impacts on wildlife would include visitor education programs, restrictions on visitor activities, and ranger patrols.

A natural resource protection program would be developed. Standard measures would include construction scheduling, biological monitoring, erosion and sediment control, fencing or other means to protect sensitive resources adjacent to construction, removing all food-related items or rubbish, salvaging topsoil, and revegetation. There also could be specific construction monitoring by resource specialists, as well as treatment and reporting procedures.

Wetlands

The National Park Service would delineate wetlands and apply protection measures during construction. Wetlands delineation would be performed by qualified NPS staff or certified wetland specialists, and wetlands would be clearly marked before construction work. Construction activities would be done cautiously to prevent damage from equipment, erosion, or siltation.

CULTURAL RESOURCES

The National Park Service would preserve and protect, to the greatest extent possible, the cultural resources of Amistad National Recreation Area. Specific mitigative measures include the following:

- Conduct additional background research, resource inventory, and national register evaluation where information about the location and significance of cultural resources is lacking. Incorporate the results of these efforts into site-specific planning and compliance documents.
- Continue to develop inventories for and oversee research about archeological, historical, and ethnographic resources to better understand and manage the resources. Continue to manage cultural resources and collections according to federal regulations and NPS guidelines. Inventory and preserve the national recreation area's collection in a manner that would meet NPS curatorial standards. Inventory all unsurveyed areas in the national recreation area for archeological, historical, and ethnographic resources.
- Avoid adverse impacts through the use of the *Secretary of the Interior's Standards for Archeology and Historic Preservation*. If adverse impacts cannot be avoided, mitigate them through a consultation process with all interested parties.
- Conduct archeological site monitoring and routine protection. During construction, avoid archeological resources as much as possible. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible. Wherever possible, locate projects and facilities in previously disturbed or existing developed areas. Design facilities to avoid known or suspected archeological resources.
- Initiate further studies to identify potential ethnographic resources in the national recreation area and formalize consultations with culturally associated American Indian people.
- Whenever possible, modify project design and features to avoid affecting cultural resources. Keep new developments relatively limited. If necessary, use vegetative screening as appropriate to minimize impacts.
- Strictly adhere to NPS standards and guidelines for the display and care of artifacts, including those used in exhibits in the visitor center. Keep irreplaceable items above the 500-year floodplain.

VISITOR SAFETY AND EXPERIENCES

The national recreation area would implement measures to reduce adverse effects from construction on visitor safety or the visitor experience.

To promote understanding among visitors Interpretation and education programs would be continued, as would directional signs and education programs. The introduction of user capacity indicators and standards would enable NPS staff to monitor impacts resulting from visitor use implement appropriate management strategies.

The national recreation area would conduct an accessibility study to understand barriers to programs, facilities, and activities for visitors. On the basis of this study, a strategy would be developed to provide the maximum level of accessibility.

HAZARDOUS MATERIALS

A spill prevention and pollution control program for hazardous materials would be put into effect. Standard measures could include procedures for storing and handling hazardous materials, spill containment, cleanup, and reporting, as well as limiting refueling and other hazardous activities to nonsensitive sites.

NOISE ABATEMENT

Standard noise abatement procedures would be practiced during construction. These could include the following elements: a schedule to minimize impacts on adjacent noise-sensitive uses, the use of the best available noise control techniques wherever feasible, the use of hydraulically or electrically powered tools when feasible, and locating stationary noise sources as far from sensitive uses as possible.

Facilities would be located and designed in ways that would minimize objectionable noise.

The users of personal watercraft and boats would be encouraged to use the new, quieter vehicles now being produced.

SCENIC RESOURCES

The following mitigative measures would be designed to minimize visual intrusions on scenic resources:

- Where appropriate, facilities such as boardwalks and fences would be used to route people away from sensitive natural and cultural resources while still permitting access to important viewpoints.
- Facilities would be designed, sited, and constructed to avert or minimize adverse effects on natural and cultural resources and visual intrusion into the natural and/or cultural landscape.
- Vegetative screening would be used where appropriate.

SOCIOECONOMIC ENVIRONMENT

The National Park Service would work with local communities and county governments to further identify potential impacts and mitigative measures that would best serve the interests and concerns of both the National Park Service and local communities. Partnerships would be pursued to improve the quality and diversity of community amenities and services.

SUSTAINABLE DESIGN AND AESTHETICS

Projects would avoid or minimize adverse impacts on natural and cultural resources. Development projects (such as buildings, facilities, utilities, roads, bridges, and trails) or

reconstruction projects (such as reconstructing roads, rehabilitating buildings, or upgrading utilities) would be designed to work in harmony with the surroundings. Projects would reduce, minimize, or eliminate air and water nonpoint-source pollution. Projects

would be sustainable whenever practicable, recycling and reusing materials, minimizing materials and energy consumption during the project, and minimizing energy consumption throughout the life of the project.

ISSUES TO BE ADDRESSED IN FUTURE PLANS

Several other issues of concern to managers and visitors at Amistad National Recreation Area are summarized below. This gives some directions and lays the groundwork for addressing these issues. However, future plans, such as the national recreation area's resource management plan, will give more specific directions and actions to deal with these issues.

AIR QUALITY

Long-range transport of air pollutants from industrial sources and urbanized areas, along with increased development in the region, could adversely affect the air quality in the national recreation area. NPS staff would work with public agencies and neighboring landowners to develop agreements to coordinate air quality management activities as part of a comprehensive effort to achieve ecosystem stability in natural resource management.

NATURAL SOUNDS AND ARTIFICIAL NOISES

Natural sounds are resources that contribute to the visitor experience at Amistad National Recreation Area. Mechanical and other

human-created sounds can be a problem in some areas.

NPS managers must determine what activities produce, or could produce, unacceptable noise levels in Amistad National Recreation Area.

NIGHT SKY

Outdoor lighting in developed areas of the national recreation area and in surrounding communities can negatively affect views of the night sky. As neighboring communities grow, the potential for light pollution affecting the night sky visibility will increase.

WATER RESOURCES AND QUALITY

Maintaining water quality is a priority at Amistad National Recreation Area. Changes in water quality and water flows could result in major effects on resources and visitors. A water resources management plan for the entire national recreation area would address these issues and other scientific and legal requirements to promote the understanding and management of the waters.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act.” Section 101 states:

[I]t is the continuing responsibility of the Federal Government to . . .

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choices;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The environmentally preferable alternative is the alternative preferred by the National Park Service for Amistad National Recreation Area in this plan. This alternative would satisfy the national environmental goals: it would provide a high level of protection of natural and cultural resources while concurrently providing for a wide range of neutral and beneficial uses of the environment. The alternative would maintain an environment that supports a diversity and variety of individual choices, and it would integrate resource protection with an appropriate range of visitor uses.

The preferred alternative surpasses the no-action alternative in realizing the full range of the section 101 national environmental policy goals. The no-action alternative would not protect resources as well as the preferred alternative. More resource impacts would result from expected increasing use levels in the no-action alternative. Adverse impacts on visitor experience also would be likely to increase under the no-action alternative. Thus, the no-action alternative would not meet the following national environmental policy goals as well as the preferred alternative:

- attain the widest range of beneficial uses of the environment without degradation
- preserve important natural aspects and maintain an environment that supports diversity and variety of individual choice
- achieve a balance between population and resource use

ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION

During the planning process for Amistad National Recreation Area, other alternative concepts for management were proposed, as follows:

1. **Decommission Amistad National Recreation Area as a Unit of the National Park System.** Under this proposal, Amistad National Recreation Area would be decommissioned and turned over to the jurisdiction of the state of Texas and the Texas Department of Parks and Wildlife. This alternative was not analyzed because of economic infeasibility, conflicts with legislative purpose, and the potential of unacceptable environmental impacts.
2. **Focus on Recreational Opportunities.** Under this alternative, the management of Amistad National Recreational Area would focus the majority of budget and

staff time on maximizing recreational activities at the national recreation area. This concept was eliminated from further analysis because there was a potential conflict with the national recreation area's purpose, significance, and legislative mandate and because there was a potential for unacceptable environmental impacts.

3. **Focus on Research Education and Awareness.** Under this alternative, the management of Amistad National Recreational Area would focus the majority of budget and staff time on research and education programs. This concept was eliminated from further analysis because there was a potential conflict with the national recreation area's purpose, significance, and legislative mandate.

TABLE 4: SUMMARY OF ALTERNATIVES

	Alternative A – No Action	Alternative B – Preferred
Concept	Maintain existing recreational opportunities and educational and interpretive programs.	Focus on Amistad’s potential as the premier recreational and educational facility in southwest Texas.
Gateway Community	Amistad would continue its existing relationship with the city of Del Rio.	Amistad would develop a relationship with Del Rio as a gateway community.
Lake Levels	Management would continue under previous (1987) <i>General Management Plan</i> .	Management would adapt and respond to fluctuating lake levels.
Security	NPS would retain existing relations with appropriate federal, state, and local agencies on national security.	Amistad would help initiate development of a Texas border strategy to increase coordination among NPS units and partner agencies.
Natural Resource Protection and Management	Existing resource protection and management programs would continue.	Existing resource programs augmented by cooperative efforts with local landowners, land managers, and other stakeholders.
Cultural Resource Protection and Management	Existing programs for cultural resource protection would be continued.	Existing educational and interpretive programs would be expanded, as would cooperative programs with Seminole Canyon State Park and research and outreach programs.
Visitor Use and Experience	Existing educational and interpretive programs would continue.	Educational and interpretive programs would be expanded.
	The national recreation area would retain existing range and levels of recreational activities.	Amistad would seek to expand existing recreational opportunities, including nonmotorized boating, hunting, hiking, camping, SCUBA diving, and shoreline fishing.
NPS Operations, Facilities, and Development	No change in current operations and facilities. Developments would be limited to improving and modifying some boat ramps.	Operations and facilities improved by addition of new visitor and administrative facilities. New visitor and administrative facilities built; campsites, boat ramps, roads, and trails improved, and other visitor access developed.
Concession Operations	Concession operations would remain at existing levels.	Concession activities would be expanded to meet demand for increased recreational activity.
Conservation Easements	No conservation easements sought.	NPS would seek conservation easements with local landowners to enhance recreational opportunities.

TABLE 5: SUMMARY OF KEY ENVIRONMENTAL CONSEQUENCES FROM ALTERNATIVES

	Alternative A – No Action	Alternative B – Preferred
Natural Resources		
Soils	Long-term minor adverse impacts. Cumulative: Long-term negligible impacts.	Same as alternative A.
Vegetation	Long-term minor adverse impacts. Cumulative: Long-term moderate to major adverse impacts.	Long-term negligible to minor adverse impacts. Cumulative: Long-term minor to moderate adverse impacts.
Water Quality	Long-term negligible to minor intermittent adverse impacts. Cumulative: Long-term minor adverse impacts.	Long-term negligible to minor adverse impacts. Cumulative: Long-term minor adverse impacts.
Wildlife	Long-term minor adverse impacts. Cumulative: Long-term minor to moderate adverse impacts.	Long-term minor adverse impacts. Cumulative: Long-term minor to moderate adverse impacts.
Threatened or Endangered Species	Long-term negligible adverse impacts. Cumulative: Long-term major adverse impacts.	Long-term negligible adverse impacts. Cumulative: Long-term major adverse impacts.
Cultural Resources		
Archeological Resources	Long-term minor adverse impacts. Cumulative: Long-term moderate to major adverse impacts.	Long-term negligible to minor adverse impacts. Cumulative: Long-term negligible to minor adverse impacts.
Museum Collections	Long-term minor to moderate beneficial effects. Cumulative: Long-term minor beneficial effects.	Long-term moderate beneficial effects. Cumulative: Long-term minor to moderate beneficial effects.
Visitor Use and Experience	Long-term minor to moderate beneficial effects. Cumulative: Long-term moderate beneficial effects.	Long-term moderate to major beneficial effects. Cumulative: Long-term moderate beneficial effects.
Socioeconomic Environment	Long-term minor beneficial effects. Cumulative: Long term moderate beneficial effects.	Long-term minor to moderate beneficial effects. Cumulative: Long-term moderate beneficial effects.
Visitor Access and Transportation	Long-term minor to moderate adverse impacts. Cumulative: Long-term minor beneficial effects.	Long-term minor beneficial effects. Cumulative: Long-term moderate beneficial effects.
NPS Operations, Facilities, and Concessions	Long-term minor beneficial effects on NPS operations. Long-term minor to moderate beneficial effects on concession operations. Cumulative: No cumulative impacts.	Long-term moderate to major beneficial effects on NPS operations. Long-term moderate beneficial effects on concession operations. Cumulative: No cumulative impacts.

Affected Environment



INTRODUCTION

This chapter describes the existing environment of Amistad National Recreation Area and the surrounding region. It is focused on the national recreation area resources, uses, facilities, and socioeconomic characteristics that have the potential to be affected if either of the alternatives were implemented. Some features are discussed because they provide context or must be considered in an environmental assessment.

Other sources of information on the natural, cultural, and human environment of Amistad National Recreation Area include the national recreation area's home page www.nps.gov/amis.

REGIONAL SETTING

Lake Amistad is situated on the United States-Mexico border, near the city of Del Rio, in southwest Texas. Lake Amistad is a reservoir created in 1969 by the impoundment of the Rio Grande and the Devils and Pecos rivers, following completion of the Amistad Dam. The dam and lake are the result of a cooperative effort between the U.S. and Mexico to develop a project that combined water storage, electrical power generation, flood control, and recreation.

Amistad National Recreation Area (national recreation area or Amistad) was authorized by Congress in 1990 (Public Law 101-628) to provide for public outdoor recreation use and enjoyment of the United States portion of Lake Amistad and to protect the scenic, scientific, cultural, and other values contributing to such enjoyment. Amistad National Recreation Area was formally established in 1990. Prior to the establishment of Amistad as a national recreation area, the recreation facilities were managed by the National Park Service. Amistad National Recreation Area encompasses 57,292 acres, most of which is the U.S. portion of the

reservoir's water surface. Amistad National Recreation Area's boundary is generally defined as the reservoir surface and shore area up to the 1,144-foot elevation contour above mean sea level, with a pool conservation level of 1,117 feet above mean sea level.

Amistad National Recreation Area is in the semiarid and sparsely populated southwest Texas Badlands, about 10 miles north/northwest of Del Rio and the neighboring community of Ciudad Acuña, Mexico. San Antonio (metropolitan area population 1.3 million in 2003) is about 150 miles east of Del Rio. The national recreation area is located entirely in unincorporated Val Verde County. Val Verde County encompasses about 3,232 square miles, ranking it the seventh largest county in Texas in terms of land area.

U.S. Highways 90 and 277/377 pass through Amistad National Recreation Area and provide the primary highway access to the major visitor facilities, boat ramps, and recreation use areas. Local roads, state spur roads, and state recreational roads connect the two major highways to specific visitor use sites. Largely surrounded by private land, most of Amistad National Recreation Area and its 540 miles of shoreline are accessible to the public only by boat.

Del Rio is the county seat of Val Verde County and home to more than 75% of the county's 44,856 (2000 Census) residents. Most of the county's remaining residents live on nearby Laughlin Air Force Base (AFB) or in nearby unincorporated areas, including several subdivisions situated on the national recreation area's perimeter near its Spur 454, Black Brush Point, and Diablo East boat ramps and visitor use facilities. Rural subdivisions, consisting largely of second/weekend homes, are near the Rough Canyon and Box Canyon sites. Other unincorporated communities in the area

include Comstock (population 375), about 28 miles northwest of Del Rio, and Langtry (population 30), about 54 miles northwest of Del Rio, near the national recreation area's western boundary on the Rio Grande (river).

Amistad National Recreation Area is one of 18 national recreation areas within the national park system. Amistad and 11 other national recreation areas contain large reservoirs and emphasize water-based recreation. Five other national recreation areas, including Golden Gate National Recreation Area, are near major

population centers and combine open space with the preservation of significant historic resources and important natural areas.

In 2004, Amistad National Recreation Area hosted 1,445,772 recreation visits, 47th highest among the 388 units in the national park system. Between 1979 and 2004, total annual recreation visits have ranged between 976,414 in 1980 and 1,591,903 in 1994. Annual recreation visitation over the 25-year period averaged about 1, 236,000.

NATURAL RESOURCES

SOILS

Soils along the United States side of Amistad Reservoir were derived from the parent limestone rock and formed through weathering and biological processes over thousands of years. The soils are almost entirely classified as Langtry-Rock outcrop Zorra. Most of these shallow, loamy soils are moderately alkaline, cobbly or stony, about 8 inches deep, and usually found over fractured limestone bedrock or strongly cemented caliche, with exposed limestone outcrops commonly found on uplands. Suitability of these soils lies primarily for wildlife habitat or range, while urban and recreational uses are poor because of depth to bedrock and slope considerations. None of the soils surrounding the national recreation area or nearby are prime farmland soil types; southeast of Amistad National Recreation Area and Del Rio some soils would be classified as such, but only if irrigation water was available.

All of the land in Val Verde County near Amistad is rangeland for sheep, goats, and cattle (even with the increasing development of lands surrounding the reservoir for residential use). Rangeland use, while a suitable use of the soils types and vegetation surrounding Amistad Reservoir, can also be a cause of erosion, nonnative plant/animal influx, and potential water quality impacts.

VEGETATION

Shoreline Vegetation

Lake Amistad is a man-made lake created when a dam was constructed on the Rio Grande in 1968; the lake level has fluctuated greatly since that time. As a result, very little shoreline vegetation exists. There is also little shoreline development at Amistad National Recreation Area. Roads provide access to

certain areas of the shoreline, with the heaviest shoreline use concentrated near the boat ramps along the southeastern side of the national recreation area. The undeveloped shoreline consists primarily of limestone boulder, cobble, and gravel, and some areas of low shoreline cliffs. In addition, no shoal formation has been detected in the national recreation area.

No permanent and intact functioning riparian vegetation exists along the reservoir shoreline because of lake level fluctuations. However, there are riparian communities along the Rio Grande, both above and below the dam as well as along the Devils River and Pecos River, that are not subject to inundation. For the first four months of 1992, the lake level was between 4 feet and 8 feet above the normal conservation level (1,117 feet above mean sea level), which was long enough to kill most native shoreline vegetation. Lake levels were also above the conservation pool for at least one month in 1987, 1988, 1989, and 1991. During 1974, the lake level was at 1,124 feet (above mean seal level) for at least six months. Lake levels receded between 1994 and 1998. By the summer of 1998, Amistad Reservoir's pool elevation had dropped 58 vertical feet and covered less than 20% of the area inundated at normal lake water levels, increasing the amount of exposed, previously inundated shoreline. Dam construction also substantially altered the natural habitat at Indian Springs and its shoreline. The dam operator tries to keep the lake level at an elevation of approximately 1,117 feet. Heavy precipitation in the winter of 2004-2005 has returned the reservoir nearly to that level. The fluctuating water level and steep rocky slopes common at Amistad do not provide the conditions necessary to support much growth of aquatic vegetation on the shoreline.

Where shoreline vegetation exists, mesic-adapted weedy species have developed in

highly disturbed plant communities. Much of the shoreline vegetation currently consists of exotic species. The percentage of cover depends on the amount of time the limestone rock or silt has been exposed. Areas exposed for months or years may support invasive nonnative species such as salt cedar (*Tamarix* sp.) and tree tobacco (*Nicotiana glauca*). The inundation zone is dominated by two common plants: Bermuda grass (*Cynodon dactylon*), an exotic, and Texas frog-fruit (*Phyla incisa*), a native plant. Both can occupy large portions of the inundation zone and provide soil erosion protection from wave action. Roosevelt weed (*Baccharis neglecta*), a native species, is also present.

Hydrilla, a nonnative submersed aquatic plant, is spreading rapidly through Texas water bodies and is now well established in 85 Texas reservoirs, including Amistad. This plant roots on the bottom of lakes, rivers, reservoirs, ponds, and ditches in depths greater than 20 feet where water clarity is good. Hydrilla also prevents wave action from stirring up sediments and is credited with increasing visibility for Amistad divers. Hydrilla, which is often considered a “severe pest” and is “illegal to possess” in Texas was likely introduced to Amistad as fragments on recreational boats. NPS staff has made no efforts or plans to eradicate hydrilla from Lake Amistad.

Before it becomes too dense, hydrilla can provide good habitat for fish. It is eaten by waterfowl and is considered an important food source by some biologists. However, hydrilla can eventually rob the water of oxygen needed for a healthy aquatic community. Fish populations are negatively affected when hydrilla exceeds 30%–40% coverage in a water body. It can also interfere with recreational activities such as boating.

Upland Vegetation

The upland areas of Amistad consist of dry rolling limestone hills and narrow side canyons. These areas support a variety of drylands-adapted vegetation, including blackbrush-acacia, ceniza, guahillo, yucca, lechugilla, leatherstem, several species of cactus, and an understory of grasses. Ocotillo, creosotebush, and beargrass occur mainly in the western half of the national recreation area.

Narrow side canyons support honey mesquite, huisache, hackberry, brush, and scattered grasses. Trees are typically low-growing and include mesquite, Texas persimmon, huisache, hackberry, live oak, pecan, walnut, and Texas mountain laurel.

The creation of Amistad Reservoir led to drastic environmental changes in vegetation. Overgrazing by domestic livestock (sheep, goats, and cattle) has eliminated grass cover from many areas in the national recreation area. Shrub density likely has increased.

WATER QUALITY

Watershed Description

The Rio Grande along the Texas-Mexico border stretches nearly 1,200 miles before reaching the Gulf of Mexico. Amistad National Recreation Area includes waters from the Rio Grande, Pecos River, and Devils River, plus a number of smaller tributaries to the Rio Grande. At conservation pool elevation (1,117 feet), the reservoir includes a total of 65,000 acres in the United States and Mexico. The Rio Grande section of Amistad National Recreation Area begins 36 miles above the confluence with the Pecos River. At conservation pool level the national recreation area manages 6 free-flowing river miles of the Rio Grande, 3 river miles of the Pecos River, and 2.7 river miles of the Devils River. At conservation pool elevation, approximately

two thirds of the surface area of Amistad Reservoir is in the United States (43,250 acres) and one third is in Mexico (21,750 acres).

Since the creation of the reservoir in 1969, the riparian zone along the Rio Grande above the Pecos River confluence has become overgrown with a complex of willow, huisache (*Acacia farnesiana*), river cane, and the nonnative salt cedar (*Tamarix* sp.).

The Pecos River, which drains a watershed of 44,000 square miles, joins the Rio Grande in the upper portion of the recreation area; 14 miles of the river are included within the national recreation area boundary. At lower water levels, much of the river channel is lined with salt cedar. However, most of this is submerged at higher water levels. The Devils River enters the north side of the reservoir in the lower portion. The Devils River drains a watershed area of 4,305 square miles. The river is spring-fed, its flow is not regulated, and it is largely uninfluenced by land use in the watershed. As a result, water quality of the Devils River is higher than in the Rio Grande or Pecos rivers. Native riparian vegetation has not been replaced by exotic species such as salt cedar and river cane in the Devils River, due to poor soils.

Water Flows

The Rio Grande, Pecos River, and Devils River contribute more than 70% of the flow into Amistad Reservoir. Average annual flows in the Devils River are slightly higher than in the Pecos River, but both rivers have flows in the range of near 100 cfs (cubic feet/second) to more than 900 cfs. Base flows in the Pecos and Devils rivers are 70–180 cfs and 110–250 cfs, respectively. The flow of the Rio Grande and Rio Conchos combined contribute more than two-thirds or 700 cfs of the flow into the reservoir.

Most of the remaining inflows are from springs that flow directly into the Rio Grande.

These springs either are upstream of the reservoir or inundated in the reservoir. Springs, the discharge of groundwater at the surface, have been very important to inhabitants of the Texas-Mexico borderlands. Their significance to this environment predates the arrival of humans to the region. Springs served as formative agents of hydrological processes and the development of vegetative and wildlife habitat. As humans moved into the area, they laid the patterns for early hunting sites, trails for communication and commerce, settlements, and some irrigation-based agriculture.

Pressure release due to well drilling and head decrease due to many years of pumping for drinking supply and agricultural use have reduced the flows substantially at many springs. Some spring flow may also have decreased due to reduced recharge over the watershed due to a shift from grass to shrub cover, and the subsequent loss of infiltration capacity resulting from a century of grazing. The completion of the Amistad Reservoir in 1969 covered many spring in the area and increased the flow of others downstream.

The Devils River has one of the largest base flows of rivers in Texas due to spring flow, and a few springs, such as Willow Springs and Indian Springs, are still visible depending on water level. Other major springs on the Devils River within Amistad National Recreation Area include Satan Springs and Lowry Springs.

The Pecos River also has several named springs within Amistad National Recreation Area, including Dead Man Springs and Pecos Springs, which are both inundated at conservation pool level. In the Rio Grande watershed, the most significant spring is the artesian Goodenough Spring, which flows into the reservoir below water surface in all but the driest years. Two kilometers west of Langtry on the Rio Grande is Pump Canyon Springs, which flows into the lake above and below conservation pool level. Eagle Nest

Springs is a group of springs that flow into the upper reaches of the Rio Grande within Amistad National Recreation Area.

Reservoir Operation

The Amistad Reservoir was designed to be used for water supply, flood control, hydro-electric generation, and recreation. At the conservation elevation of 1,117 feet, the reservoir holds 3,150,000 acre-feet of water. The Amistad Reservoir works in tandem with the Falcon Reservoir about 350 miles downstream of Amistad. Virtually all of the water released from the Amistad Reservoir goes to the Falcon Reservoir, where it is used for irrigation in the lower Rio Grande valley. At conservation elevation, about 85% of the water passing through these two reservoirs is used by agriculture.

Outflows from the reservoir change abruptly in response to storms and irrigation demands downstream. In a typical year, the highest outflows (about 7,000 cfs) occur during the spring and early summer. Lower outflows (less than 1,500 cfs) typically are seen the remainder of the year, except in response to storms.

Texas Surface Water Quality

In accordance with Environmental Protection Agency (EPA) guidelines, the Texas Commission on Environmental Quality (TCEQ) (formerly the Texas Natural Resource Conservation Commission [TNRCC]) has classified major stream segments in the state according to designated uses. Potential uses within a segment include aquatic life, contact recreation, public water supply, and general uses, all of which are fully supported at Amistad. Segments are described in appendix C of the “Texas Surface Water Quality Standards” of the *Texas Administrative Code* (30 TAC 307). To support or achieve the designated uses of these stream segments, the

commission has promulgated numerical criteria for each use and each segment. The “Water Quality Data” section below describes the water quality parameters compiled for standard pollutants at Amistad Reservoir. The Amistad Reservoir, Rio Grande, and lower Pecos River also have “high aquatic life” as a designated use. The Devils River has “exceptional aquatic life” as a designated use.

Antidegradation Policy —The state-established antidegradation policy (sec. 307.5, “Texas Surface Water Quality Standards”) is designed to protect water quality at existing levels and to prevent a deterioration of water quality below achievable uses for a given stream segment. The policy has three levels of protection:

- Existing uses will be maintained and protected.
- For instream segments whose quality exceeds designated uses, degradation may only be allowed for important social and economic development.
- No degradation will be allowed for outstanding natural resource waters. No waters in the state are currently designated as an outstanding natural resource

For Amistad Reservoir and the primary rivers feeding into the reservoir, anti-degradation means that existing uses should be maintained and protected.

Water Quality Data

Water quality in the Rio Grande has been the subject of many studies and monitoring efforts by several agencies. A sufficient period of record exists to be able to identify trends, particularly the rising salinity and increases in several trace metals. Pecos River water quality has also been fairly well studied. The Devils River has less information available, although the existing data indicates the water quality is

excellent with a low risk of future contamination.

Both the Texas Commission on Environmental Quality and the U.S. Geological Survey (USGS) have active water quality monitoring programs in and around Amistad Reservoir. Both agencies sample the major tributaries to the reservoir, the Pecos and Devils River, and the Rio Grande, as well as the Rio Grande below the dam. The commission also samples the reservoir at three locations for field parameters, nutrients, chlorophyll, and bacteria.

The USGS sites on the Pecos River near Langtry and on the Rio Grande at Foster Ranch have been part of the Rio Grande National Stream Quality Accounting Network (NASQAN) monitoring program since 1996. The Rio Grande station 3.4 miles below Amistad Dam has been part of the NASQAN program since 1997. These sites are sampled six to eight times a year for a variety of constituents, including nutrients, major ions, water soluble pesticides, and trace elements. The 2001-2005 Rio Grande NASQAN program will continue to monitor these sites. However, the future of the Rio Grande NASQAN program is in doubt. If it is discontinued, alternative sampling arrangements will have to be made. The Devils River at Pafford Crossing near Comstock, Texas site is currently sampled by the TCEQ Quality Surface Water Quality Monitoring Program (SWQM) staff; the flow gauge is now operated by the International Boundary and Water Commission (IBWC).

Monitoring sites that are part of SWQM program are funded by the U.S. Environmental Protection Agency (USEPA) grant money. The commission and the U.S. Geological Survey have collected water quality data at most of these stations since the 1970s. Through the Texas Clean Rivers Program (CRP) funds, the International Boundary and Water Commission coordinates monitoring activities in the Rio Grande

Basin by supporting efforts of monitoring partners including: the International Boundary and Water Commission; the Texas Commission on Environmental Quality; U.S. Geological Survey; National Park Service; the Upper Pecos Soil and Water Conservation District; the cities of Del Rio, Laredo, and Brownsville; and the Rio Grande International Study Center at Laredo. This monitoring program supports special projects, acts as a clearinghouse for data, provides a point of contact for issues in the Rio Grande basin, and provides annual summary reports. As a part of the Clean Rivers Program, the International Boundary and Water Commission funds lab analysis and shipping costs for water quality samples collected upstream in Big Bend National Park.

Water quality data were compiled from 84 monitoring stations for up to 30 years (depending on the monitoring station), from 1964 through 1993. The principal water quality parameters compiled and summarized include temperature, dissolved oxygen, pH levels, turbidity, coliform bacteria, chloride, nitrate, sulfate, metals, and selected pesticides/herbicides. Additional parameters such as conductance, transparency, alkalinity, and polychlorinated biphenyls (PCBs) were measured at some monitoring stations.

Salinity

Salinity in the Rio Grande above and below Amistad and in the Pecos River has been increasing since at least 1975. During the growing season, salinity levels can triple due to irrigation return flow. With increasing salinity in the tributaries, Amistad Reservoir has had rising salinity since 1983. The Rio Grande is the largest tributary of the reservoir, with the majority of the water coming from the Rio Conchos, which joins the Rio Grande at Presidio, Texas. However, the Pecos River and the flow from the Rio Grande above the Rio Conchos contribute significantly more to the salt-loading of the reservoir due to the

high salinity of both these rivers as compared to the Rio Conchos.

Salinity levels in the Rio Grande above the Rio Conchos vary with the amount of rainfall. During wet years, rainfall dilutes the concentration of salts in the river from irrigation return flows and municipal wastewater discharges from El Paso and Ciudad Juarez. Salinity levels in the other river reaches follow the same pattern with the exception of large flow events. High salinity has been measured during and after low water periods on the Rio Conchos and the Pecos rivers. Periods of high flow saturate stream banks, leaching salts into the river as the river recedes. Salinity is higher during low flows just after a high flow event, indicating that the salts are leached from streambanks into the river during floods and then are carried downstream during and after the high flows.

Salinity levels in Amistad Reservoir are reduced somewhat by the inflow of fresh water from the Devils River and freshwater springs under and adjacent to the reservoir. However salinity levels in the reservoir are rising at a rate of 15 milligrams/liter per year. Calculations of salt inflow and outflow of Amistad Reservoir indicate that there may be a continuing accumulation of salts in the reservoir. This is due to the drought that has continued since 1993, in which the Pecos River is providing a greater proportion of reservoir inflows than historically has been the case. Also, flows from the comparatively fresh water Rio Conchos have been diminished. Historically, this river has provided 80% of the flow in the Rio Grande, but since 1993 it has only contributed about 50%. In a few years salinity at Amistad Reservoir may have a significant impact on irrigated crops and drinking water downstream. Salinity levels in the Rio Grande and Pecos are currently high, indicating that salinity levels in the reservoir are probably still increasing.

Nutrients

High levels of nitrogen and phosphorus can cause excessive growth of algae and other aquatic plants. This can result in an imbalance between dissolved oxygen production and consumption. Excessive growth of plankton and algae blooms causes the production of extremely high levels of dissolved oxygen during daytime due to photosynthesis. When photosynthesis ceases at night, these same organisms and other aquatic flora consume oxygen, causing oxygen levels to drop. During periods of low flow and warm temperatures, oxygen levels can drop to critically low levels in nutrient rich systems. Fish kills can result as well as impacts on other aquatic life. High nutrient levels can also alter the species composition and diversity of aquatic life. These nutrients are present in fertilizers and human and animal waste.

Algae and Algae Blooms

Algae are primarily single-celled organisms found ubiquitously throughout the world but are most abundant in aquatic systems. Most freshwater algae belong to the group chlorophyta or green algae. Most of the single-celled algae are free-floating phytoplankton, while many are filamentous multicellular forms, which attach to rocks and other solid surfaces. Some algae have broad and flexible requirements for their habitat, including temperature, salinity, light, oxygen and carbon dioxide, nutrients, and water movement. Amistad provides an amazing diversity of physical, chemical, and connected biological systems that provides opportunity for many of the broad requirement algae while also nurturing very select and narrow condition locations that likely favor more select algal communities.

Algae blooms appear to be an issue primarily in the Pecos River. Algae blooms have not been documented in the reservoir to date, although algal blooms have occurred in the

Rio Grande through the Lower Canyons above the reservoir. Large algal blooms associated with fish kills have occurred several times on the Pecos, usually during cold weather. Although no studies of the algae of Amistad reservoir and most of its land area and springs have been completed, algae have been implicated in several fish kills in the Pecos and Rio Grande adjacent to the reservoir. Fish kills are probably the most common reason that algae are investigated in aquatic systems. Fish are sensitive to dissolved oxygen deficits in rivers and lakes when an overabundance of algae critically depresses oxygen levels in the water. Certain algae also release specific toxins in aquatic systems during seasonal periods, in response to nutrient conditions or upon death of large masses of the algae.

In Amistad Reservoir, as in all aquatic environments, algae tend to grow faster and more abundantly when temperatures rise and nutrients abound. Thus a warm reservoir, such as Amistad, that receives any increasing loads of nutrients from local or river-delivered land runoff, wastewater treatment discharges, or leaking septic systems, might experience increases in algal growth or blooms of nuisance species. These algae can provide a food source for zooplankton and eventually fish, but also can be a source of toxins or cause of oxygen starvation for fish in portions of the reservoir.

Metals and Trace Elements

Two bi-national toxic studies, the USGS NAQAN stations, and several other studies that have analyzed sediment have detected a variety of metals and trace elements in Amistad Reservoir and its tributaries. Analysis indicates that most trace elements appear to be steady, although mercury concentrations are increasing in the Pecos River, the Rio Grande above Amistad, and in the reservoir itself. Selenium is also increasing in Amistad Reservoir. The only trace elements with a

decreasing trend are copper in Amistad Reservoir and silver in the Pecos River.

In another study, sediment cores were sampled from both the Rio Grande arm and the Devils River arm. Eight metals, including arsenic, chromium, copper, lead, mercury, nickel, vanadium, and zinc, have statistically significant increasing trends in the Rio Grande arm. Levels of concentrations of both mercury and nickel more than doubled between 1969 and 1995. All but lead and chromium were found to be increasing in the Devils River arm of the reservoir. All of these metals are associated with atmospheric sources such as burning of fossil fuels and incineration of solid waste.

Other Contributions Affecting Water Quality Conditions — Oil and Gas Contamination

Boating activity within Amistad National Recreation Area includes houseboats, fishing and speedboats, and personal watercraft. All these watercraft contribute pollutants of concern to the waters within the national recreation area. The effects of oil and gas contamination on water quality are present, but to what degree is unknown at this time.

The principal sources of oil and gas contamination at Amistad are (1) the use of two-cycle outboard motors, and (2) on the water refueling at marinas. Emissions from two-cycle engines, in which oil is mixed with the fuel, often produce a sheen on the water. This is readily observed when boats are started and idled in calm water conditions. No known studies at Amistad Reservoir have addressed this issue or whether the level of contamination is even measurable with current levels of use. This effect is most noticeable when there are heavy concentrations of boats operating in protected areas such as the Diablo East and Rough Canyon harbors at peak use. Greater amounts of contaminants are probably emitted when boats are operating at higher

speeds, but those effects would be more dispersed and not as noticeable.

Oil and gas exploratory work is occurring along the Pecos River. Three known wells have been established in the past 10 years near Dead Man's Canyon, a tributary to the Pecos River. Drilling is ongoing and appears to be a permanent operation.

In addition to oil and gas contamination, there is the potential for hazardous material spills occurring within the highway and railroad corridors adjacent to the reservoir.

Human Waste/Gray Water

Amistad Reservoir is affected by human waste from camping and gray water from camping and houseboating. Camping activities on the shorelines of Amistad Reservoir produce noticeable amounts of human waste in certain areas of the reservoir. Two heavily impacted areas are popular campsites on the Devils and Pecos arms of the reservoir. Until 1994, heavy camping use on the Pecos River produced undesirable impacts on the limited numbers of campsites available. Almost every suitable campsite, those riverbank areas with soil and vegetation for wind breaks and privacy, had at least one, and in some cases several, visitor-created pit toilets. Fluctuating lake levels would occasionally place many of these toilets under water. Similar conditions can also be found on the Devils River arm of the lake and to a lesser degree in the Cow Creek area. In other backcountry areas of the national recreation area this has not been a noticeable problem primarily due to the wider disbursement of campers.

Human waste problems have not generally been associated with houseboats due to the use of approved marine sanitation devices. Houseboats add a substantial amount of gray water into the lake. However, because the houseboats are dispersed, it is usually not concentrated in specific areas. Human waste

problems in frontcountry areas have also not contributed significantly to water quality problems because of the staff's ability to place portable toilet facilities at problem locations with little delay and to construct suitable toilets. Water quality problems with gray water from boat campers and houseboats have traditionally been perceived as less of a problem.

WILDLIFE AND WILDLIFE HABITAT

Lake Amistad National Recreation Area is in a transition zone of three major biotic communities — Chihuahuan Desert from the west, Edwards Plateau to the north, and Tamaulipan shrubland to the south and east. The climate is semiarid and continental, with dry winters and hot summers. Mean annual precipitation is 17.2 inches, falling primarily between April and October. Most of the soils are very shallow to shallow, moderately alkaline, stony loams underlain by caliche. Rock outcrops with no soil development comprise about 15% to 35% of the area.

South Texas brushlands converge on the Chihuahuan Desert to the southwest and on the Tamaulipan chaparral country to the southeast. Most NPS lands are chaparral country — low hills and valleys near the dam, with canyons primarily upstream.

Lake Amistad's 1995 biological survey identified four plant communities as potentially occurring at the national recreation area, including one grassland (the Curlymesquite-Sideoats Grama series) and three shrublands (the Cenizo, Guajillo, and Blackbrush series). The grassland may have become extirpated due to overgrazing. Overgrazing and fires have encouraged the proliferation of woody, less palatable species that form the current plant community at Amistad.

Several bird and fish species exist in the area, and hunting is permitted for deer, mouflon

and aoudad sheep, javelina, turkey, rabbits, feral hogs, dove, quail, teal, and ducks.

Mammals

Approximately 62 species of mammals occur in Val Verde County; many of these species have been documented in the national recreation area, including mountain lions, deer, rabbits, skunks, and other small mammals. Some bat specimens have been collected or observed within Amistad National Recreation Area, and some bat species are thought to occur but have not been documented. Numerous limestone caves that could provide habitat for bats are found in a large area around and including Lake Amistad. Beaver occur in the national recreation area and are fairly common. Mountain lions have been sighted on occasion. Black bear are occasionally sighted near campgrounds (see below for additional information about bats and black bears).

Birds

Amistad is on the central flyway for migratory birds, and Amistad is habitat for both resident and migratory birds. The national recreation area has not documented any illegal issues related to the Migratory Bird Treaty Act. With the exception of the interior least tern, Amistad's migratory birds nest high enough above ground to not be affected by wave action. Interior least terns lay eggs in the ground, and they have been impacted by inundation caused by the dam. The terns do not nest close enough to the water for eggs to be damaged by wave action, and all sensitive nesting areas are closed to public use by posting signs in the water.

Forty-five species of birds exist at Amistad National Recreation Area, and more than 300 bird species exist in Val Verde County. Common birds seen in Amistad include vultures, ravens, scaled quail, mourning and

white-winged doves, hawks, herons, sandpipers, and occasionally eagles. Several federally listed species are known to occur.

Fish

Amistad Reservoir is a popular fishing destination, and bass fishing tournaments are held nearly every weekend year-round. Anglers fish for black bass, stripers, channel and yellow catfish, crappie, and sunfish. Large-mouth bass and channel catfish were stocked when the reservoir was partially filled, and fish stocking is still occurring as part of fishery management. The reservoir also holds alligator and longnose gar, shad, carp, blue and flathead catfish, white bass, and freshwater drum. The Devils River minnow is a U.S. endangered fish that existed in the rivers that feed into the reservoir before flooding, but its current status in the national recreation area is undetermined (see below for more information).

Lake Amistad is at the northern terminus of the range of many species. Despite the fact that much of the historic habitat of these species has been inundated, it is still possible that some of these species may be found in the national recreation area. These include the Mexican blind cave tetra, the Conchos pupfish, the Tamaulipas shiner, the Phantom shiner, and the Rio Grande shiner. It is likely that some of these fish species are found nowhere else within the national park system.

Amphibians and Reptiles

In 2003 and 2004, a reptile and amphibian inventory documented 45 species within the national recreation area boundary. An earlier study documented or found historic records of 77 reptile and amphibian species in or near the national recreation area. However, the researchers conducting the current study estimated that there are probably only 55 reptile and amphibian species in the national

recreation area boundary at present. No federally listed amphibians or reptiles have been recorded for Val Verde County. Three state-threatened species (Texas indigo snake, Trans-Pecos black-headed snake, and the Texas horned lizard) have been observed in the national recreation area.

Aquatic Invertebrates

Amistad's 1995 biological survey does not list aquatic invertebrates. Generally, the abundance and type of organisms present depend on the water quality and habitat conditions within Lake Amistad. The Amistad shoreline has little to no aquatic vegetation, reducing the potential diversity and density of shoreline aquatic invertebrates. Also, because Amistad is fed by several rivers, the relatively high turnover rate in the reservoir is likely to reduce its productivity, as compared to other mesotrophic or eutrophic Texas lakes, which are not riverine ecological systems. Thus, the diversity and abundance of invertebrates along the Amistad shoreline is expected to be low.

THREATENED, ENDANGERED, OR SPECIES OF SPECIAL CONCERN — WILDLIFE

With regard to the federal status species, the only species currently known to inhabit the national recreation area is the interior least tern. Other species, such as the American peregrine falcon, black-capped vireo, brown pelican, and whooping crane (all listed as endangered) may occur within Amistad National Recreation Area. The arctic peregrine falcon, bald eagle, piping plover, and Devils River minnow (all listed as threatened) may also occur in the national recreation area.

Federal Endangered Species — Wildlife

Birds. American Peregrine Falcon — Confirmed sightings of the American peregrine falcon occurred in 1991, 1992, 1993, 1994, and 1998. The American peregrine is a resident of the Trans-Pecos region (which includes the Amistad Reservoir area). They use habitat over the water and the shoreline edge. However, according to NPS staff, falcons only migrate through Amistad. Peregrine falcons prefer meadows, mudflats, beaches, marshes, and lakes where birds are abundant. They nest on cliff edges.

Black-capped Vireo — The first and only confirmed sighting of a black-capped vireo in the national recreation area was made on April 24, 1993, in the Rough Canyon district. It is believed that the vireo was passing through the national recreation area, following the Devils River Canyon en route to known nesting areas outside the boundary. The vireo's preferred habitat is low brush on steep slopes in the vicinity of dry streambeds.

Brown Pelican — Six brown pelicans were observed on December 21, 1989, inside the national recreation area near the Rough Canyon Marina. One bird was observed flying with a group of white pelicans on the Devils River in the summer of 1991. One bird was sighted on the Rio Grande arm of the reservoir from April to May 1992. Additional sightings occurred in September and October 1996, also on the Rio Grande arm of the reservoir. One brown pelican was observed in October 1997 flying between Scuba Cove and Diablo East Harbor. There are no documented records of brown pelicans nesting at Amistad Reservoir. The pelicans feed directly over the water on fish from the reservoir.

Interior Least Tern — Approximately 80 to 160 interior least terns arrive at the reservoir in April or May of each year and nest on several of the exposed islands in the national recreation area. They leave in mid to late August. Their preferred nesting habitat is a gravelly

surface with no vegetation, and they return to the same general areas of the lake each year. They prefer islands that have been recently exposed as a result of lower lake levels because there is no vegetation. The terns feed in shallow waters adjacent to the islands, diving into the water in search of small fish.

The “Superintendent’s Compendium” closes all least tern nesting colony sites to the public. To further protect terns from human disturbance, including motorized and nonmotorized boat and personal watercraft users, signs are posted in approximately 18 inches of water adjacent to sensitive nesting grounds to warn all visitors to stay away. Placing warning signs in water (rather than on the islands) prevents employees or visitors from accidentally stepping on eggs (which resemble rocks) or hatchlings, which “freeze” when threatened and camouflage with the background. The signs are placed as soon as staff can determine that the terns are using a specific island for nesting, and they are removed at the end of August after the terns have left.

NPS staff are aware of no instance when someone has knowingly beached a boat and walked onto a nesting island marked with warning signs.

No extra law enforcement efforts have been required to monitor the tern nesting sites, but NPS staff check the posted nesting islands during boat patrols to ensure that no boats or people are on the island disturbing the terns.

Whooping Crane — No sightings of whooping cranes have been confirmed at Lake Amistad. However, one sighting of a crane in flight was confirmed in Big Bend National Park flying; it was suspected that the bird was using the Rio Grande as a flyway. It is possible that the crane would fly through the boundaries of Amistad Reservoir. The whooping crane is listed as a migratory species that might fly through Val Verde County. Its habitat includes large wetland areas.

Fish. *Rio Grande silvery minnow* — This is an endangered species that historically occurred in the Rio Grande. Habitat for this fish remains in the national recreation area. This species may still be found in the national recreation area.

The beaver is listed as an endangered species by Mexico but not by the United States or Texas. The national recreation area has not been contacted by Mexican counterparts concerning providing protection for beaver in Lake Amistad.

Federal Threatened Species — Wildlife

Birds. *Arctic Peregrine Falcon* — The arctic peregrine falcon is listed for Amistad Reservoir at the request of the U.S. Fish and Wildlife Service due to its similar appearance to the American peregrine falcon. There have been confirmed sightings of peregrine falcons at Amistad Reservoir, but no documented proof of any nesting activity.

Bald Eagle — Adult bald eagles, seen singly or occasionally in pairs, are observed nearly every winter along the cliffs of the Rio Grande near, upstream, and downstream from the confluence with the Pecos River. Sightings are usually made between October and February, with confirmed sightings each year from 1987 through 1993. A single adult was sighted on February 21, 1996, flying along the Rio Grande about 5 miles downstream of the mouth of the Pecos River. There are no documented cases of bald eagles nesting in the Amistad Reservoir area. An immature bald eagle was sighted near the U.S. Highway 90 bridge near the Governors Landing campground on September 26, 1997, and was observed again in the general area on October 29, 1997. Bald eagle habitat consists of rivers and lakeshores with large, tall trees.

Piping Plover — There have been no confirmed sightings of piping plovers at Amistad Reservoir. This species is listed for Amistad

Reservoir at the request of the U.S. Fish and Wildlife Service because it is a migratory species that might pass through Val Verde County. Habitat consists of sandy beaches and lakeshores.

Fish. *Devils River Minnow* — The Devils River minnow is a U.S. threatened fish that existed in the rivers that feed into the reservoir before the dam was constructed, but its current status in the national recreation area is undetermined. The Devils River minnow has not been collected from Amistad Reservoir. This fish requires flowing water, and is not found in standing water, such as a reservoir. It exists in small stream channels of the Devils River, the bottom of which consists of a limestone bed in areas outside the flooded boundary of the reservoir. This limestone bed makes access by boats, including canoes, extremely difficult.

Federal Candidate Species — Wildlife

Birds. *Mountain Plover* — No documented sightings of the mountain plover (a candidate species) have occurred in the national recreation area. However, it is possible that mountain plovers may occur in the national recreation area; they spend summer months in the Trans-Pecos region of Texas. The plovers prefer areas of freshly cut grass and might be observed in the area around Amistad Dam in short or freshly cut grass. Their habitat would not be the general shoreline.

Federal Species of Concern — Wildlife

Amphibians. *Texas Salamander* — NPS records show that in 1961 a Texas salamander was documented 3.5 miles north of Del Rio in Four-mile Cave, which is south of the present San Pedro arm of the reservoir. There have been no recent documented sightings of this species inside the national recreation area. The salamander's habitat includes small subterranean streams, spring seepages, and

the headwaters of creeks. No Texas salamanders were observed during the 2003-04 national recreation area -wide herpetology inventory. However, specimens could be living below ground in sinkholes containing water.

Birds. *Audubon's Oriole* — No known sightings of Audubon's oriole have occurred in the national recreation area, although it is known to occur in Val Verde County. This species is probably more common in the Lower Rio Grande. According to NPS staff, the closest population of this species is south of Laredo, Texas, about 200 miles south of Amistad. This species prefers habitat of dense brushland dominated by mesquite or Texas ebony.

Black Tern — A group of 15 to 20 black terns was observed at Amistad Reservoir in August 1994. There had been no confirmed sightings of this species at the reservoir before these sightings. The black tern is an accidental visitor in Texas. Black tern habitats are lakes, ponds, marshes, and coastal areas (during migration).

Ferruginous Hawk — Single ferruginous hawks were observed in the national recreation area in 1985, 1988, and 1989. The Texas Parks and Wildlife Department considers this bird an irregular visitor. This species prefers to nest in conifers (which do not exist in the park), as well as on cliffs, banks, buttes, or slopes.

Mexican Hooded Oriole — Mexican hooded orioles have been observed in the national recreation area. Sightings occurred between April 23 and April 26, 1993, at the Diablo East maintenance yard, Rough Canyon, the Spur 406 campground, and along the Rio Grande below the dam. They were also observed nesting adjacent to the dam in 1992, 1993, and 1994. This species prefers dense brushland dominated by mesquite or Texas ebony.

Texas Olive Sparrow — Approximately 12 Texas olive sparrows were observed along Spur 406 in and above the campground on April 25, 1993. About a dozen sparrows were observed below the dam the following day. The olive sparrow is known to occur in Val Verde County and prefers a habitat of dense brushlands dominated by mesquite or Texas ebony.

Western Burrowing Owl — The western burrowing owl was sighted in the San Pedro campground area in 1975. An NPS ranger also observed this species along the access road into the campground from mid-November 1994 continuously through mid-March 1995. One individual was also seen at a burrow entrance. Habitat includes open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of piñon and ponderosa pine.

White-faced Ibis — Three white-faced ibis were observed inside the national recreation area on September 20, 22, and November 1, 1975. Six individuals were counted in the Del Rio area in 1989. Small flocks of five to eight birds were seen in migratory flight west of Del Rio on September 19, 1987. This species probably occurs as a migrant through the national recreation area. It prefers a habitat of marshes, rice fields, and swamps. It is a wading bird that feeds on small crustaceans, insects, leeches, and small fish.

Fish. Seven category 2 fish species are thought to occur in the national recreation area. Specific information from the Texas Natural Heritage Program and other sources follows. All of these fish exist mostly in perennial streams. They are primarily restricted to a few sites upstream of the main body of the reservoir in small stream channels. They require flowing water and are not found in standing water, such as a reservoir. Inundation has limited their habitat range within the boundaries of the national recreation area.

Blotched Gambusia — The blotched gambusia was once present in the Devils River, but is now considered extirpated from the state of Texas and extinct in the United States, although it is still common in the Rio Conchos of Mexico (which enters the Rio Grande about 250 miles north of Amistad). NPS records show that nine specimens were collected in 1958 from the upper portions of the old Devils Lake, which was inundated when the reservoir was filled in 1969. There is no record of this species in the national recreation area since 1972.

Blue Sucker — The Texas Parks and Wildlife Department collected one blue sucker specimen from the reservoir in 1978 or 1979 during a fish sampling survey. The Texas Natural Heritage Program lists this species as occurring in Val Verde County. Its habitat consists of strong currents in deep (1–2.5 m.) chutes and main channels of medium to large rivers.

Chihuahua Shiner — No records show the Chihuahua shiner being collected in Amistad Reservoir. However, the U.S. Fish and Wildlife Service lists this species as possibly occurring in the Amistad Reservoir area. The range of this species includes the Rio Grande drainage in the Big Bend region of southwest Texas and northern Mexico.

Conchos Pupfish — There are no records of the Conchos pupfish being collected from the Amistad Reservoir area. However, the Texas Natural Heritage Program lists two occurrences of this species in Val Verde County, the second of which is on the Devils River a short distance upstream from the national recreation area boundary. It is possible that this species is present in the national recreation area in the area of the Devils River (not in the main body of Amistad Reservoir). Its habitat includes sloughs, backwaters, and the margins of small to medium rivers.

Proserpine Shiner — One proserpine shiner specimen was collected in the national recreation area on October 20, 1975, in a

shallow spring in a Little Satan Creek tributary. The Texas Parks and Wildlife Department collected at least one specimen in December 1989 in San Felipe Creek, which is outside the national recreation area boundary. The department also lists five occurrences of this species in Val Verde County, one of which is near the Amistad Reservoir. The range for this species is the Devils River, Lower Pecos River, and nearby tributaries of the Rio Grande. Its habitat includes rocky runs and pools, as well as creeks. The Texas Natural Heritage Program lists seven known occurrences of this species in Val Verde County, including Amistad Reservoir. NPS records document that on June 28, 1974, one specimen was collected inside the park 1 mile south of the Air Force marina. Several specimens were also collected outside the national recreation area in December 1989 in San Felipe Creek, which flows into the Rio Grande downstream from the national recreation area boundary. It is thought to be common in the Devils River. Its range includes the lower Rio Grande drainage, Sycamore Creek, Devils River, and the lower Pecos River. Its habitat includes gravel and rubble riffles in creeks and small rivers.

Rio Grande Darter — There have been seven known occurrences of this species in Val Verde County, including Amistad Reservoir. NPS records document that on June 28, 1974, one specimen was collected inside the national recreation area 1 mile south of the Air Force marina by a road culvert. Several specimens were collected outside the national recreation area in 1989 in San Felipe Creek, which is in Del Rio and flows into the Rio Grande. The range for this species is the lower Rio Grande drainage in Texas and Mexico. It is common in the Devils River. Its habitat includes gravel and rubble riffles of creeks and small rivers.

Rio Grande Shiner — The Rio Grande shiner was common in the old Devils Lake on the Rio Grande before reservoir inundation in 1972. There are no records of this species having

been collected at Amistad Reservoir since 1972. The current status of this species is undetermined. Its range includes the Rio Grande drainage in Texas and Mexico; it is thought to be common in the lower Rio Grande.

Invertebrates. *Salina Mucket, Texas Hornshell, Mexican Fawnsfoot* — Three freshwater mussels have been documented as occurring in Val Verde County and most likely in the area of Amistad Reservoir. A salina mucket specimen was collected alive in 1984 from the Rio Grande near Del Rio, Texas. The Texas hornshell has historically occurred along the Rio Grande, Pecos River, and Devils River. The endangered mussel can now only be found in Texas in the lower canyon area of Big Bend National Park. The Mexican fawnsfoot has historically occurred along the Rio Grande in Val Verde County.

Mammals. The biological survey conducted in 1995 concluded that Lake Amistad is not likely to contain any important habitat area for any rare mammal. However, the presence of limestone caves provides potential habitat for bats.

Cave Myotis — The cave myotis is a year-round Texas resident, which spends summer months in the Trans-Pecos region. It is the most abundant bat of the Edwards Plateau, which is in south central Texas east of the Pecos River and west of the Colorado River. This bat usually roosts in caves and tunnels, and it often hibernates in the same sites as the Townsend's big-eared bat and Yuma myotis (see below). Specimens have been collected in a variety of areas within Amistad National Recreation Area along the Rio Grande and at the mouth of the Pecos River.

Greater Western Mastiff — The U.S. Fish and Wildlife Service collected one greater western mastiff bat in the Langtry, Texas, adjacent to the Amistad boundary. No recent sightings of this species have been confirmed, but it could be present in the national recreation area. This

bat has been found near the Rio Grande in Val Verde. It inhabits rugged, rocky canyon country, and roosting sites always allow at least a 3-meter unobstructed drop for initiating flight. Mastiffs use habitat over the water and cliff edges, and they seek refuge in rock crevices or overhanging ledges in vertical or nearly vertical cliffs. Suitable habitat for this species exists throughout Amistad National Recreation Area, possibly in the vertical limestone cliffs that occur in the national recreation area. Rock outcrops with no soil development comprise about 15% to 35% of the area.

Pale Townsend's Big-eared Bat — Pale Townsend's big-eared bat specimens have been collected from within the boundaries of Amistad National Recreation Area (including the mouth of the Pecos River) and the Langtry area. These bats inhabit rugged, rocky canyon country and are common in caves and abandoned mine tunnels of the Trans-Pecos. They do not use rock crevices and cracks, as do many other species. These bats are intolerant of disturbance and will quickly abandon a roost site that has been disturbed.

Yuma Myotis — Specimens of the Yuma myotis have also been collected from within the boundaries of Amistad National Recreation Area. It is a summer resident of the southern Trans-Pecos region and the area east of the Pecos River in Val Verde County. This bat is commonly encountered in lowland habitats near open water, where it prefers to forage. Most specimens collected in Texas have come from areas near the Rio Grande. Large nursery colonies may form in buildings, caves, mine tunnels, and under bridges from late May to early June. Nursery colonies are very sensitive and quickly abandoned if disturbed.

Reptiles. *Reticulate Collared Lizard* — The reticulate collared lizard has not been observed in the national recreation area, but its range is believed to extend up the Rio Grande Valley into Val Verde County. It is a

resident of thornbrush deserts, requiring open brush grasslands and thornscrub vegetation, and it is often found on scattered flat rocks below escarpments or isolated rock outcrops among scattered clumps of prickly pear cactus and mesquite.

Texas Horned Lizard — The Texas horned lizard prefers warm, sandy, arid environments and is typically found in flat, open areas with little vegetation. The lizard is active during the daytime until it retreats into shaded areas to avoid the most intense heat of the day. It was considered abundant at Amistad in the 1960s. Fourteen specimens were collected in 1966 during a reptile survey. Numbers dropped dramatically in the 1950s and 60s due to pesticide use. A reptile/amphibian survey was conducted in 1993 in the area of the Air Force Marina in the national recreation area, but no Texas horned lizards were identified. However, three individuals were documented in the 2003-04 national recreation area-wide herpetology inventory.

State Endangered Species — Wildlife

Fish. *Phantom Shiner, Bluntnose Shiner* — Two state listed endangered fish (the phantom shiner and the bluntnose shiner) were thought to have occurred in Val Verde County, inhabiting the main channels of the Rio Grande in low velocity water and sandy substrate. However, the phantom shiner is thought to be extinct, and no NPS records indicate a specimen ever being collected in the national recreation area. No bluntnose shiner specimens have ever been collected in the national recreation area either. One specimen of a subspecies was collected at the confluence of the Pecos River and Rio Grande some time before 1960. The species is now apparently found only in New Mexico (although not seen there since 1950), and it is no longer thought to occur in Texas. Like the U.S. listed fishes, these fish would occur mostly in perennial streams upstream of the

main body of the reservoir and would require flowing water.

Mammals. *Black Bear* — Only one state listed endangered mammal, the black bear, has been recently observed inside the national recreation area boundary. Distribution in Texas is now restricted to remnant populations in mountainous areas of the Trans-Pecos region. Sightings in the national recreation area are rare and are thought to be of individuals who have crossed the Rio Grande from Mexico during drought situations. There were confirmed sightings of the Mexican species of black bear in the area of the 277 North campground in 1994. There were also confirmed sightings of black bears in the mid-1980s near the San Pedro campground area. However, the sightings were all of black bears passing through the area, and none of the bears remained for any length of time. Black bears have been restricted by human inroads to remote, less accessible mountainous areas or to nearly impenetrable thickets along water courses.

State Threatened Species — Wildlife

Birds. *Zone-tailed Hawk and Wood Stork* — Two birds are listed as state threatened and could possibly visit the national recreation area. The zone-tailed hawk, a rare and local summer resident of the Rio Grande, has some potential to occur inside the national recreation area and might occasionally visit the area. NPS staff have observed this hawk over the reservoir between 1998 and 2002. The last two observations were between Langtry and the Pecos River. They use habitat above the inundation zone, which is the elevation between current water level and the conservation pool. The zone-tailed hawk's habitat consists of forested canyons and riverside woodlands.

The wood stork is thought to occur in Val Verde County, but there are no data documenting a confirmed sighting in the

national recreation area. It is considered an irregular visitor to Texas. It is possible that this species may occasionally pass through the Amistad area while traveling from central to northern Texas in late summer. It is unlikely that this species nests in the area because the nest is a platform of sticks in a tree in a swamp. Habitat includes freshwater and brackish wetlands, primarily nesting in cypress or mangrove swamps.

Reptiles. *Texas Indigo Snake* — The Texas indigo snake is a state threatened reptile that is found in the southern part of the state and is known to occur in the national recreation area. It has been observed along the Viewpoint Road, along the Spur 454 roadway, and in the area of the Spur 406 campground. It is likely that this species can be found throughout the national recreation area. This snake prefers moist riparian breaks in thornbrush woodlands and mesquite savannah.

Texas Tortoise — The Texas tortoise is another state threatened reptile that is known to occur in the national recreation area. An individual was observed on October 3, 1993, near the Diablo East ranger station. This species has been frequently observed near the IBWC office and work sites. Its habitat includes well-drained sandy soil.

Big Bend Blackhead Snake — NPS records show no occurrences of the state-threatened Big Bend blackhead snake. However, the Texas Natural Heritage Program lists five occurrences of this species in Val Verde County. One of these listings is in Langtry, adjacent to the north side of the national recreation area. Another occurrence is listed as northwest of Del Rio, which could put it close to or inside the national recreation area boundary.

State Special Concern Species — Wildlife

Hairy-legged Vampire Bat — Texas lists one special concern species, the hairy-legged

vampire bat, as a mammal with potential for occurrence at Amistad. This species primarily inhabits tropical and subtropical forest lands, where its daytime retreat is normally a cave, but it has been found roosting in mine tunnels and hollow trees. The Texas Natural Heritage Program lists only one occurrence of this species in Val Verde County. NPS records indicate that the only documented occurrence of this species in the United States was a single female specimen collected inside the national recreation area on May 24, 1967, from inside the lower railroad tunnel along the Rio Grande, 4 miles downstream of the confluence of the Rio Grande and the Pecos River. The single specimen extended the known range of this species approximately 725 km to the northwest of Tamaulipas, Mexico, where it is more often encountered.

THREATENED, ENDANGERED, OR SPECIES OF SPECIAL CONCERN — PLANT SPECIES

According to the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department, Amistad National Recreation Area may provide habitat for two plants listed by the federal government and none listed exclusively by the state, as shown in appendix B.

Federal Endangered Species — Plant Species

Texas Snowbell — The federally endangered Texas snowbell is thought to occur in the national recreation area, but it has not been confirmed. Documented sightings have occurred in the Dolan Springs natural area, which is a short distance upriver from the national recreation area boundary on the Devils River. This plant is found only on limestone outcrops along perennial water courses in sycamore/willow woodlands, Texas oak woodlands, netleaf hackberry/ little walnut woodlands, plateau liveoak/netleaf

hackberry woodlands, or ash juniper/oak woodlands.

Tobusch Fishhook Cactus — Like the Texas snowbell, the federally endangered Tobusch fishhook cactus is also thought to occur in the national recreation area, but has not been confirmed. Documented sightings have occurred in the Dolan Springs natural area. This cactus prefers very shallow gravelly soil in shortgrass grasslands among live oak/ juniper woodlands on limestone uplands or occasionally in gravel along creek bottoms.

Federal Species of Concern — Plant Species

Ten U.S. listed plant species of concern are known to occur in Val Verde County and may occur within national recreation area boundaries; however, there are no documented sightings of any of these plants inside the national recreation area. With the possible exception of the Correll's false dragon-head and the Wright's water-willow, these species exist outside of the reservoir inundation zone. Therefore, these species would not be found along the reservoir shoreline. They are not adapted to inundation factors, and exotic species have taken over the shoreline.

Cliff Bedstraw — One known occurrence of cliff bedstraw was documented in Langtry, and it was also documented in the national recreation area near Langtry during a 2003 plant inventory. Its habitat is the crevices of vertical canyon walls and is found only on massive limestone rock faces.

Correll's False Dragon-head — Two known occurrences of Correll's false dragon-head were documented in Val Verde County southwest of Del Rio. Its habitat is water along streams and in irrigation ditches, and it occurs only along perennially or seasonally wet areas. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Perennial Caltrop — Two known occurrences of perennial caltrop were documented in Val Verde County; one in Shumla, one in Langtry. Shumla is a deserted town close to the NPS boundary between the Rio Grande arm and the Pecos River arm of the reservoir, making it possible that this plant occurs within the national recreation area, and the Texas Natural Heritage Program believes there is a high probability that this species does exist in the national recreation area.

Rydberg's Scurfpea — Known populations of Rydberg's scurfpea in Val Verde County include two in Rough Canyon and one southwest of Del Rio; the location of a fourth population has not been confirmed. The two populations in Rough Canyon could be inside the national recreation area, but that has not been confirmed. In March 1993 one population of the plant was located along U.S. Highway 277 several miles north of the 277 North campground. This population was on the highway right-of-way and not inside the NPS boundary. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Sabinal Prairie-clover — There are two known occurrences of sabinal prairie-clover in Val Verde County, both in Carruthers Draw, which is 30 miles north of Del Rio on U.S. Highway 277 outside the national recreation area. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Sonora Fleabane — There are four known occurrences of Sonora fleabane in Val Verde County — one southwest of Del Rio, one

southeast of Del Rio, one northeast of Del Rio, and one northwest of Del Rio. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Texas Greasebush — One known occurrence of the Texas greasebush was documented in Val Verde County, but no further information is available. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Texas Trumpet — There are two known occurrences of Texas Trumpet in Val Verde County — one northeast of Del Rio, the other in Carruthers Draw. The plant's habitat is dry soil along and near the Rio Grande in west Texas. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

Warnock's Rock-daisy — There are two known occurrences of Warnock's rock-daisy in Val Verde County — one in Pandale and one at Hackberry Crossing. Pandale is on the Pecos River about 40 miles upriver from the national recreation area boundary. This species occurs on massive limestone rock faces.

Wright's Water-willow — There are two known occurrences of Wright's water-willow in Val Verde County — one is southwest of Del Rio, and the other location is unavailable. According to the Texas Natural Heritage Program, there is a high probability that this species exists in the national recreation area.

CULTURAL RESOURCES

NPS surveys in the 1980s of the Lower Pecos Canyon portion of the national recreation area covered about 90% to 95% of the federal property in this portion of the national recreation area. This area is included in the Lower Pecos Canyon Archeological District, which was listed on the National Register of Historic Places in 1971 and covers 34 acres; it includes 72 archeological sites, as well as the historic Lt. Bullis' Trail, which is considered eligible for listing but is not currently included in the district. Three other national historic districts are located within the national recreation area — Mile Canyon, which covers 1,500 acres and contains three sites; Rattlesnake Canyon, which covers 1 acre and contains one site; and Seminole Canyon, which covers 14,170 acres and contains 91 sites.

An extended period of low pool elevations began in 1994, exposing previously documented as well as new sites, and the NPS staff began drought-related archeological surveys around the reservoir. The survey reinvestigated about 100 of the most important sites around the reservoir, resulting in the identification of more than 250 new sites overlooked during the 1960s pre-inundation research. Boaters have been “exploring” recently exposed archeological and historical sites around the reservoir, but NPS staff has not been able to quantify the exact amount of damage that may be occurring as a result. The staff has developed only Parida and Panther Cave for access by water (boat or personal watercraft).

Fluctuating water levels pose a threat to cultural resources because water levels can increase or decrease 4 to 6 inches per day, and most water-related damage to archeological sites is caused by wave action. Wave action studies were conducted in relationship to effects on cultural resources. Sites identified in NPS surveys have been “affected by wave-action from high winds, passing boats, and

fluctuating reservoir levels”. Winds are responsible for most of the wave action damage to cultural sites, especially during the winter, when winds upwards of 50 mph can cause major damage to sites along the southern shorelines. Some cultural resource areas exist on solid rock, high above the water level, so they are not disturbed by wave action. Ground slope is believed to be the primary determinant of the severity of wave action damage to archeological sites.

HISTORICAL BACKGROUND

The Lower Pecos River region of southwest Texas has one of the densest concentrations of Archaic rock art in the New World. The area is especially known for its polychromatic pictographs. Although the early inhabitants of the area did not construct any permanent structures or raise crops or livestock, they did leave pictographs ranging up to 30 feet in height, animal remains, textiles, bone and wooden artifacts, and plant materials in the rock shelters they inhabited, providing evidence of human habitation extending back for 12,000 years.

According to the *Amistad National Recreation Area Cultural Resources Study* (NPS 1994), the prehistory of the lower Pecos River region (the intersection of the Pecos, Devils, and Rio Grande) includes the Paleo-Indian occupation (before 7000 BC), the Archaic period (7000 BC to AD 600), the Late Historic period (AD 600 to 1600), and the Historic period (since the close of the 16th century).

The Lower Pecos River region rock art is considered to be comparable in significance to sites in Europe, Australia, and America's Baja California. The region contains some of the oldest dated and best preserved archeological deposits in North America. Most of these sites can be accessed by boat on the Pecos River,

the Rio Grande, and the Devils River. However, most of these sites are accessible by land vehicle and are located on private property.

During historic times settlement was scattered, and there were no major towns. Spanish expeditions traveled through the Amistad Reservoir basin. By 1680 many groups native to the Amistad area were displaced or exterminated. Most historic American Indian populations associated with this region merely passed through en route to Mexico. The Lipan Apache and the Mescalero Apache might have sporadically occupied the area between 1680 and 1880. Several pictographs are attributed to Southern Plains Indian groups who traversed the region after 1680. In 1821, the region became part of Mexico.

The region comprising Amistad became part of the United States in 1848. The United States Army began to establish outposts in the area around this time, shortly after the Apache, Kiowa, and the Kickapoo tribes had moved into the Lower Rio Grande region, replacing the last of the local Native American groups.

Commercial and military transportation routes crossed the Amistad basin. The San Antonio–El Paso road became a target of raids by bandits and roving Native American groups, resulting in an increased military presence and several skirmishes within the boundaries of the present-day national recreation area. Increasingly aggressive tactics by the U.S. Army, including raids on Native American villages in Mexico, reduced the threat of Native American raids and allowed increasing numbers of American settlers to establish livestock operations.

The completion of the Southern Transcontinental railroad in 1883 opened west Texas and northern Mexico to commercial purposes and European settlement. Sheep and goat ranching quickly spread across the region. Overgrazing, deep-well drilling for water, and the suppression of natural grass fires lead to drastic environmental changes in the area. By

World War II ranching had transformed much of the region into the scrub and thorn brush countryside that characterizes the area today. Ranching remains the economic cornerstone of the regional economy.

In 1944 the United States International Boundary and Water Commission and the government of Mexico signed a joint water treaty that proposed to construct, operate, and maintain three international hydroelectric and flood control dams along the Pecos River, including Amistad. The National Park Service operated the Amistad Recreation Area primarily as a water-oriented recreation unit of the national park system under a cooperative agreement with the United States section of the International Boundary and Water Commission from November 11, 1965, to November 27, 1990, when congressional legislation created Amistad National Recreation Area.

ARCHEOLOGICAL RESOURCES

The *Amistad National Recreation Area Cultural Resources Study* (NPS 1994) states that the Lower Pecos River region contains one of the longest continuous records of human occupation in North America. Archeological research before the construction of Amistad Dam firmly established the existence of literally hundreds of prehistoric pictograph and archeological sites. There are four National Register of Historic Places archeological districts encompassing 182 individual sites that are at least partially within the national recreation area. These include Lower Pecos Canyon, Mile Canyon, Rattlesnake Canyon, and Seminole Canyon.

The lower Pecos River region contains one of the largest and densest concentrations of Archaic period pictographic rock art in North America. Of the 29 pictograph sites in the Lower Pecos Canyon Archeological District, 26 are on private property. Of the three rock art sites on federal property, only one has not

been inundated by Amistad Reservoir. The oldest and most common pictograph style, the Pecos River style, features large (up to 13.1 feet) multicolored anthropomorphic figures in multiple panels, which can cover more than 98.4 feet of rockshelter wall. Three pictographs have been dated to 3,000 to 4,200 years BP (before the present).

Amistad National Recreation Area manages about 1,900 known historic and prehistoric archeological sites. These sites are scattered around the 540-mile shoreline of Amistad Reservoir, which includes portions of the Devils, Pecos, and Rio Grande valleys. Although numerous sites were inundated following the creation of Amistad Reservoir, other important sites remained above water. An NPS rock art deterioration study established that many pictographs in the region are deteriorating, primarily due to natural causes. However, vandals have intentionally destroyed some sites, and early photographers unknowingly damaged the pictographs with water or kerosene to enhance contrasts. Other pictographs have been damaged by modern campfires or are submerged in Amistad Reservoir.

Submerged Cultural Resources

Before the flooding of portions of the Pecos, Devils, and Rio Grande valleys, the National Park Service and the University of Texas at Austin conducted nearly 10 years of cultural resources inventory work that collectively documented more than 300 prehistoric archeological sites. This work included the excavation of 22 major sites, which produced a museum collection estimated to contain in excess of 1 million objects.

Amistad Reservoir water levels began dropping in spring of 1994. By the end of summer 1998, Amistad Reservoir had dropped 56 vertical feet, covering less than 20% of the area it had at normal lake levels.

In 1994 NPS staff began drought-related reconnaissance-level archeological surveys in selected areas around the reservoir where visitor activities were greatest. The surveys quickly demonstrated that previously inundated sites, documented years earlier during pre-inundation research, were being exposed, and perhaps dozens of previously undocumented sites were appearing in predictable places along the 500-mile reservoir shoreline. Condition assessments at these newly exposed sites demonstrated that most of the observed effects were the products of natural forces (wind, water, and wave-action damage). Unintentional damage from grazing and visitor use activities (camping, off-road driving) were also taking a toll on the resources. Evidence of looting and vandalism appeared to be minimal. Two years later, a second assessment of looting and vandalism confirmed the initial assessments.

By the fall of 1996 nearly 100 miles of shoreline and intermittent drainages were surveyed, resulting in the identification and initial documentation of 72 previously unrecorded archeological sites. Combined with the results of other low-water surveys (1994–1996), a total of 112 undocumented and formerly inundated sites have been documented to date.

Boaters have begun “exploring” recently exposed archeological and historical sites around the reservoir, which could potentially result in looting or vandalism. It is difficult to quantify the exact amount of damage that may be occurring.

Information on the national recreation area’s Web site suggests that scuba divers explore the boat wrecks and several submerged ranch houses that were inundated by the reservoir.

MUSEUM COLLECTIONS

Amistad National Recreation Area is home to the third-largest museum collection in the national park system. The NPS museum

collection includes museum objects (archeological materials and natural history specimens); paper archives (resource management files, many maps in various formats, and historical records); photographic materials (negatives, prints, and slides); and magnetic media (floppy disks, tape backups, CD ROMs, and DVDs).

The natural recreation area's collection includes artifacts from more than 200 sites and 22 major excavations. In FY03, the NPS

collection was estimated to contain 1,385,368 objects. The pre-reservoir collection includes materials from roughly 250 different archeological sites that were investigated prior to the impoundment of waters behind Amistad Reservoir in 1969. The NPS museum collection is the single largest archeological assemblage from the Lower Pecos River region of southwest Texas, an area that has seen near continuous archeological research since it was first investigated by the Smithsonian Institution in the 1930s.

VISITOR USE AND EXPERIENCE

Amistad National Recreation Area is in a remote area of southwest Texas, and it is relatively undeveloped. Del Rio is near the southeast end of the recreation area. Del Rio shares a border with Ciudad Acuña in Mexico. The nearest large U.S. metropolitan areas are San Antonio (150 miles east) and San Angelo (150 miles north).

Between 1 million and 1.5 million people visit Amistad each year. About 85% come for water-based recreational activities; the rest take advantage of camping and day use facilities. About two-thirds of all visitors are considered regional — from southwestern Texas and southern New Mexico, including San Antonio, San Angelo, Midland/Odessa, and Hobbs, New Mexico. The remainder are destination visitors from other areas, and “through” visitors traveling in west Texas and stopping at Amistad along the way. Visitors also come from Mexico, Houston, and Fort Worth, driving as long as 7–10 hours. Many “winter Texans” (retirees who leave less temperate environments and migrate south) reside in the Amistad area during the winter months.

ANNUAL VISITOR USE

Recreational visitation records for Amistad dating to 1979 indicate that national recreation area visitation has ranged from a low of 976,414 visitors in 1981 to a peak of 1,591,903 visitors in 1994. Peak visitation occurred in the period from 1992 to 1995. Visitation in 2004 totaled 1,445,772.

Census data for Val Verde County (in which Del Rio is located) and Bexar County (San Antonio) show a population change of 15.8% and 17.5% (respectively) between 1990 and 2000. The population of the state of Texas increased by 22.8% during this same period. This is above the national population increase

of 13.1%. Although trends show that state population may continue to increase, visitation is more difficult to predict.

Amistad National Recreation Area visitation correlates very closely with lake levels. Amistad Reservoir levels began dropping in 1994, and subsequent visitation shows a sharp decrease, with gains from 1998 through 2004. Rising water levels during that period have resulted in a corresponding increase in recreation visits to the reservoir. Lake level fluctuations during this period affect visitors differently; for example, there was a decrease in the numbers of swimmers and campers due to low lake levels, but an increase in motor-boat and personal watercraft users.

VISITOR DISTRIBUTION

Monthly visitor use is documented from 1979 to 2004 in the national recreation area, which is open year-round. The highest visitor use occurs between March and September, with March and September often showing higher visitation than some summer months. Because visitor use is distributed geographically throughout the reservoir, use was analyzed by type and location. Visitor use tends to concentrate in the southeastern portion of the lake, in and around the dam, Diablo East, Governor’s Landing, and Air Force marina sites. In these areas, the water is deepest and access from Del Rio is easiest, and it is where most of the national recreation area facilities are located.

SEASONAL USE PATTERNS

Spring is the busiest visitor use period. In most years visitation increases between March and June. Visitation in July and August decreases because of high temperatures and humidity. September sometimes shows a spike in visitation. Winter visitation decreases;

however, boating and fishing are still popular during the winter months, and RV camping dramatically increases during the winter. For example, 461 boat trailers and one personal watercraft trailer were counted at the Diablo East Marina in January 2002.

Watercraft use at Amistad occurs most frequently on weekends during the spring. Holiday weekends at Amistad are crowded, particularly July 4. Recreational vehicle camping increases dramatically from November to April.

Amistad offers some of the best sailing in southwest Texas, and some of the best wild river experiences in Texas are available for people canoeing and kayaking on the reservoir and tributary rivers. Hikers enjoy the chaparral desert environment and have opportunities to see archeological resources.

VISITOR ACTIVITIES

Amistad supports a wide variety of watercraft activities throughout the year, including powerboating, waterskiing, houseboating, boat fishing, sightseeing by boat, sailboating, sailboarding, canoeing, and kayaking. Although recreational boating activities occur year-round, they increase during the summer due to warmer water and air temperature.

Fishing

Amistad National Recreation Area provides one of the outstanding fishing experiences in the American Southwest. The waters of Lake Amistad are home to a number of fresh-water game species, including white bass, striped bass, spotted bass, smallmouth bass, largemouth bass, channel catfish, and blue catfish. Three major sports fisheries are in the U.S. portion of Lake Amistad. These include catfish, bass, and striped bass. Amistad hosts approximately 150 fishing tournament annually, most of which focus on bass fishing.

The reservoir also attracts thousands of nontournament fishermen.

There is some commercial fishing on the Mexican portion of the reservoir. Yearly commercial catches average 234.5 metric tons. Sport fishing has gained in popularity on the Mexican portion of Lake Amistad.

The fish population in the U.S. portion of the reservoir is managed by the Texas Parks and Wildlife Department. The National Park Service is responsible for the management of tournament and other recreational fishing on the U.S. side of the international boundary.

Hunting

Amistad National Recreation Area provides one of the only large tracts of public land available for hunting in southwest Texas. Hunters comprise about 1% of the visitors to Amistad. Hunting opportunities include upland and waterfowl hunting as well as big game hunting. The hunting season at Amistad extends from the opening date of the state of Texas fall hunting season through the last Sunday in February. (Opening dates vary by year and animal. Check the Texas Parks and Wildlife Department's hunting seasons for Val Verde County for specific dates.)

Camping

The National Park Service operates four campgrounds at Amistad, located at 277 North (17 sites), San Pedro (35 sites), Governors Landing (15 sites), and Spur 406 (8 sites). Several campgrounds are near boat launches. At Spur 406, camping is permitted outside the developed area, but only within the posted campground boundaries. These campgrounds are open all year. Group camping (for a minimum of 15 campers) is permitted at Rock Quarry, San Pedro, and 277 North. Boaters also camp along the shoreline throughout the national recreation area,

constituting the backcountry users. Over 500 fire rings have been documented throughout the national recreation area (outside designated campgrounds); usually they are along the shoreline and are used by boat campers.

The number of campers has been decreasing. A high of 47,915 campground overnight stays were recorded in 1993, dropping almost in half to a low of 20,286 in 1998 and increasing slightly in 1999 to 21,237. In 2001, 23,364 campground stays were recorded; in 2002, 14,243; in 2003, 12,882; and in 2004, 14,818.

Hiking

Hiking is permitted throughout Amistad National Recreation Area, and nature trails with interpretive signs can be found at Pecos and Diablo East. Visitors are asked to obtain a copy of the official map and guide, which shows the boundaries hikers must stay within. Several visitors regularly walk along the roadways as a form of exercise. This type of use occurs year-round, although it increases between November and April with the arrival of “winter Texans.” The number of hikers currently using the national recreation area totals less than 1% of national recreation area users.

Cultural Sites

At least 1% of visitors to Amistad are drawn by NPS-developed archeological and historic sites. This number fluctuates according to lake levels because some interpretive sites are inaccessible at low water levels. For example, from 1989 to 1994, more than 5,000 boats per year visited either Parida Cave or Panther Cave. At low water levels, hikers were able to access Parida Cave via the historic railroad bed that is inundated at high water levels.

Seminole Canyon State Park and Historic Site received more than 53,000 visitors in 2003,

4,000 of whom participated in the tours to rock art sites in the canyon. The state park also offers two reservation-only tours to archeological and historic sites.

The Rock Art Foundation also offers seasonal tours to several rock art sites on their property adjacent to the NPS boundaries.

Shoreline Use

Roads provide access to certain areas of the Amistad Reservoir shoreline. The heaviest shoreline use is near the boat ramps at Diablo East, Southwinds Marina, Rough Canyon, and Spur 454. These ramps are concentrated near the southeastern side of the national recreation area, which has the best road access and is closest to Del Rio. The San Pedro Canyon area, which is near Diablo East and Spur 454, is popular with swimmers and sunbathers.

Swimming

Water temperatures at Lake Amistad range from 54°F in winter to 86°F in late summer, making it a popular destination for swimmers. Lake Amistad has several unsupervised swim beaches that are popular when lake levels are high. These swim beaches include Rough Canyon, Scuba Cove, Governors Landing, and 277 North. Swimming declines at these beaches during periods of low water. The swim beach near the dam has been closed because of dam security concerns. The Scuba Cove swim beach, which is near Diablo East, is popular with divers and swimmers when the lake was full, but divers rarely visit it during low lake levels. Visitation to the beach on busy summer weekends is expected to increase with higher lake levels.

Governors Landing has been the most popular beach, and it is still a busy swimming location, with about 30 to 50 swimmers on busy summer weekends. No swimming is permitted in harbors or from docks.

Several unofficial swim beaches have formed during periods of low water. The Spur 454 San Pedro Cliffs area is not a designated swim beach, but many visitors swim here now. Approximately 40 to 60 swimmers visit the area on busy summer weekends. The peninsula across the road from Spur 454 to the southwest of San Pedro Cliffs has become another popular swim area. Although this area is not a designed swim beach, approximately 20 to 30 swimmers visit the shoreline on peak user days. The Horseshoe Cliffs area has become another popular, undesignated swim beach. This area is about 0.5 mile from San Pedro Cliffs on the San Pedro arm of the lake. All of the new swim areas are under water when lake levels are high.

Scuba Diving

Amistad's exceptionally clear water makes it an excellent place for scuba diving, and it is popular for divers wanting to become certified. Depending on lake levels, there are several submerged ranch houses to explore. Use at the Diablo East dive cove decreases during low lake levels. During past high lake levels, about 20 to 60 scuba diving students took certification dives on busy summer weekends. Rental equipment is available in Del Rio.

Boat Tours

The Park Service does not provide boat tours. A tour boat study was conducted in 1990, which recommended that operators be allowed to provide interpretive tours at the Pecos River. This operator would be an entity that already had boats and experience providing interpretive tours.

Five private fishing guides and three boat tour guides (including one that conducts kayak and canoe tours) provide services on Lake Amistad under incidental business permits. All but three operate from Del Rio. The others

operate from Comstock, Texas, which is east of the mouth of the Pecos River.

Watercraft Use (Motorboats, Canoes, and Sea Kayaks)

A variety of watercraft uses Amistad Reservoir. Bass boats associated with fishing tournaments comprise a large portion of the boating activity at Lake Amistad. Lake Amistad is among the top 10 bass fishing lakes in Texas, attracting anglers from all over Texas and occasionally from other states as well. The largest bass tournaments have attracted as many as 550 boats for a single tournament weekend, and many smaller bass tournaments of 60 or fewer boats are held at the lake nearly every weekend. On some weekends there may be as many as 12 small bass tournaments. During bass tournaments, anglers tend to fish the entire lake, but concentrate less on the upper Devils River, the Pecos River, and the upper Rio Grande. Most fishing is done from boats, and anglers seldom go ashore. Very few areas of the national recreation area are accessible by road, which precludes much fishing from the shore. There are a number of fishing docks for the nonboating fishing public.

Recreational boats not associated with bass tournaments comprise another large portion of the boating activity at Amistad. These users come to waterski, sightsee, relax, swim, camp, hunt, and fish (nontournament fishing). Recreational boating activities occur year-round, increasing during the summer due to warmer water temperatures. Motorized watercraft also includes personal watercraft or "jet skis," which are small vessels that use an inboard internal combustion engine to power a water jet pump as its primary source of propulsion.

Nonmotorized watercraft comprises a separate category of recreational boating that includes sailboats, sailboards, canoes, and kayaks. Sea kayakers and canoeists comprise

very small numbers of visitors. Sailboaters prefer the large area of water in front of the Diablo East Harbor. They also travel to the mouth of the Devils River and up the Rio Grande as far as the Box Canyon boat ramp area. Sailboarders tend to launch from the Governors Landing swim beach area because the prevailing southeast winds are at their backs, making it easier to travel away from the shore and into the reservoir. Canoes and kayaks primarily travel the Devils River, although some use the Pecos River, even at low water levels.

One private boat tour operator provides kayak and canoe tours on Lake Amistad. He has an incidental business permit and works out of Comstock, just east of the mouth of the Pecos River. He rents two large canoes, which seat 18 to 20 people, and approximately 10 to 15 regular-sized canoes. Renters usually canoe the Pecos or Devils Rivers. The national recreation area has several boat ramps that are designated launching sites: These include: Diablo East, Rough Canyon, Southwinds Marina (Air Force), Box Canyon, Blackbrush Point, 277 North Campground, 277 South, Pecos River, Spur 406 Campground, Spur 454, and Steam Plant Road.

The Pecos River and Spur 406 are used primarily by small, flat-bottom johnboats. During periods of low water, motorized boats are strongly advised not attempt to travel the Pecos River upstream from the ramp. Boating visitors choose destinations based on which boat ramp they use, planned activities, current lake level, and time of year.

VISITOR SATISFACTION

Four hundred survey cards were distributed to a random sample of visitors in the national recreation area from February 1 to 28, 2001; less than 30 were returned, which is not enough to calculate a statistical response. However, of those who did respond, 85% of were "satisfied overall with appropriate facilities, services, and recreational opportunities." The majority of visitors rated outdoor recreation as either very good (46%) or good (43%). The remainder (11%) rated outdoor activities as average. Eight percent rated commercial services in the national recreation area as very poor, even though most respondents rated these services as good (46%) and very good (23%).

SOCIOECONOMIC ENVIRONMENT

ECONOMIC CONDITIONS

Economic data for the region portray a regional economy that is relatively diversified, but nonetheless dependent on travel; recreation and tourism; the public sector; health care and social services; and administrative, management, and transportation and distribution support for more than 50 *maquiladoras* operating in the Del Rio/Cuidad Acuña area. (Maquiladoras are manufacturing and assembly plants in Mexico near the U.S.-Mexico border that produce finished goods for export, using imported parts and assemblies.) The maquiladoras employ more than 33,000 workers.

The economic stimulus provided by the maquiladora industry, the national recreation area, and other influences has resulted in steady economic growth for Val Verde County over time. More than 9,300 jobs were created in the county between 1970 and 2001, 5,300 of which have been added since 1991. Total government employment actually declined slightly over the period.

Public sector employment includes federal civilian, military, and state and local government employment. Local governments, primarily Val Verde County and the city of Del Rio, account for the single largest share of the region's public sector employment. State government agencies with a local presence include the Texas Workforce Commission and Departments of Transportation and Public Safety. In addition to the National Park Service, federal employment includes civilian and military personnel associated with Laughlin Air Force Base, the U.S. International Boundary and Water Commission, and the Department of Homeland Security (DHS). Employment in DHS bureaus has increased dramatically since 2001.

Agriculture has a long-established role in the post-European settlement and subsequent economic development of the southwest. Agriculture's economic role has changed over time due to industrialization, but it remains an important influence due to its implications for landownership and land use. Val Verde County agriculture is comprised predominantly of operations engaged in livestock ranching. Tracing its local history to the earliest days of the western civilization of the region, the local ranching industry raises cattle, goats, and sheep, tied to wide expanses of private rangeland. The 1997 Census of Agriculture enumerated 238 farms covering nearly 1.75 million acres in Val Verde County. Of all local farms and ranches, about half raise and sell cattle, with a comparable number running sheep and lambs. Crop production associated with local farming involves only a small share of local agricultural lands because of the lack of irrigation water. In 1997, cropland under cultivation totaled just 3,670 acres in Val Verde County.

POPULATION

Val Verde County is sparsely populated, despite cumulative population growth of 63.2% between 1970 and 2000 that raised the total resident population to 44,856 in 2000. Population growth during the 1970s added nearly 8,400 residents. That growth is attributed, in part, to recreation-oriented business and residential development occurring in the wake of the completion of the Amistad Dam and filling of Lake Amistad. Nearly 800 retail trade and services jobs were created between 1973, when the lake first reached its conservation pool elevation, and 1978.

Overall growth and development waned in the 1980s as the number of local manufacturing jobs declined and Laughlin Air Force Base experienced cutbacks in the number of

military personnel assigned to the base. DHS employment dramatically increased in the late 1990s. However, federal civilian employment in the area increased and second-home development continued. The net results of these influences resulted in a modest net population gain concentrated in the unincorporated portion of the county.

Net migration accounted for a substantial portion of the population increase. The 2000 Census estimated 8,691 residents of Val Verde County, 5 years old or older, had moved to the area since 1995. That number represented 20% of all residents. Among the recently arriving residents, 42% had moved from elsewhere in Texas, 38% from other states, and 20% from other countries.

The long-term outlook for Val Verde County is for continued population growth. Projections released by the Texas State Data Center call for a population of between 50,016 and 51,846 in 2010 and between 55,233 and 57,437 in 2020. If realized, those projections would represent a net increase of between 10,377 and 12,581, or 23% and 28%, over two decades.

SUPPORTING COMMUNITY INFRASTRUCTURE

Del Rio is the largest community in Texas for nearly 150 miles. As such, it has developed as a regional trade and service center serving business, consumer, and traveler needs for a large area. Ciudad Acuña, across the U.S.-Mexico border from Del Rio is a city of more than 110,000 whose residents contribute substantially to the Del Rio economy.

Del Rio's retail sector includes more than 180 stores and shops and 94 bars, restaurants, hotels, motels, and campgrounds that cater to residents and visitors alike, many of the latter drawn by Amistad National Recreation Area and other local attractions. Together the overnight lodging establishments offer about

1,100 rooms and more than 500 trailer, RV, and camping spaces. A number of boat sales and maintenance establishments, numerous boat storage facilities, and dive shops also developed in the area following the completion of Lake Amistad. However, the extended period of low water and the temporary prohibition on personal watercraft exacted an economic toll on such businesses, resulting in a contraction in the number of such businesses. In 2002, 1,089 local businesses, including the retail and hospitality establishments, recorded more than \$721 million in gross retail sales, of which \$256.7 million was subject to retail sales tax.

THE ECONOMIC CONTRIBUTIONS OF AMISTAD NATIONAL RECREATION AREA TO THE LOCAL ECONOMY

More than a decade after its establishment, Amistad National Recreation Area, its staff, their households, and the seasonal residents and visitors to the National Recreation Area are integral parts of the region's economic and social structure. Some of key dimensions of Amistad National Recreation Area's role in the affected environment are described below.

The Economic Contributions of Amistad National Recreation Area Operations

Since its establishment, staffing at Amistad National Recreation Area has risen to respond to the administration and management needs associated with accommodating more than 1.0 million recreation visits per year, two major concession operations, and the extensive inventory of visitor facilities, trails, and other improvements that are in place. Authorized staffing at Amistad National Recreation Area is 38 full-time employees. Construction contractors, seasonal campground hosts, and other volunteers supplement the national recreation area's permanent staff.

The Economic Contributions of Recreation Use at Amistad National Recreation Area

In addition to the economic contributions due to operations, which are recurrent, construction activities at Amistad National Recreation Area generate additional one-time job, income, and business volume impacts. The magnitudes of such impacts are functions of the dollar value of the project, the type of project, and the extent to which private contractors are used.

Substantial as they are, the direct economic contributions attributable to direct NPS operations at the national recreation area are only a portion of the overall economic contribution associated with the facility when visitor spending in the local economy is considered. Boating and boat fishing are the predominant recreation activities at Amistad National Recreation Area. Other popular activities include birding, hunting, camping, picnicking, water-skiing, scuba diving (when water conditions permit), and cultural/history study. Visitation initially grew as Lake Amistad filled and recreation facilities and adjacent residential and commercial development was completed, but visitation has since fluctuated over time in response to the varying pool elevations and the effects of pool elevation on recreation access and opportunities.

A key factor underlying the relationship between pool elevation and visitation is the impact of a declining pool on accessibility. Declining pool elevations not only forces the closure of boat ramps, but restricts boat access to several popular areas due to shallow waters and limits shore access from other day use areas. These effects not only adversely affect the level of visitation and use, but also concentrate boating and parking demand in the remaining boat ramp/launch sites. At the same time, the below normal pool elevations have helped Amistad garner recognition as one of the prime black bass fishing areas in Texas, which has in turn drawn many local, regional, and statewide fishing tournaments to the

facility. In fact, as is discussed more fully below, bass fishing tournaments are now one of the major sources of economic stimulus associated with Amistad National Recreation Area.

Annual recreation use at the national recreation area since 1979 has ranged from 946,414 in 1982 to 1,591,903 in 1994. Annual recreation visits between 1979 and 2002 averaged 1,239,100 visits. In 2004, 1,445,772 recreational visits were recorded. Most recreation use at Amistad National Recreation Area is day use. Estimated average overnight use between 1979 and 2002 is about 63,100 tent, RV, and backcountry campers. The amount of camping use was much higher in the early years of Amistad's operations, but has been much lower in recent times, averaging just 24,900 campers between 1998 and 2001.

The peak recreation season at Amistad National Recreation Area is late spring/early summer. Historically, peak visitation occurs in April, followed by May and June. Lowest recreation use tends to be in November and December. April, June, and December have exhibited the greatest range of monthly visitation over time. Like other areas in the nation's southern states offering warmer climates and similar outdoor recreation amenities, seasonal visitation patterns at Amistad National Recreation Area have undergone some change due to the seasonal "snowbird" migration of retirees.

Nonlocal visitors who stay overnight in area hotels, motels, and RV campgrounds, and those who rent houseboats from the local marinas generate the largest relative economic contributions. The direct effects of visitor spending accrue primarily to the lodging, eating and drinking, amusement, and retail trade sectors. In turn, the direct expenditures generate indirect and induced effects as a portion of the spending recirculates through the local economy.

Local residents accounted for an estimated 30% of all recreation visits to Amistad National Recreation Area. Nonlocal day use visitors, many of whom stopped at one or more of the recreation sites as they traveled through the area to other destinations accounted for an estimated 58% of all recreation visits. Overnight visitors, including those who stayed in the national recreation area, e.g., at one of the group campgrounds or on houseboats, and those staying in local area accommodations accounted for the remaining 12% of all recreation visitors.

On average, recreation visitors spend \$49 per party per day, with a range of between \$33 per party per day for nonlocal day users, to \$213 per party per day for nonlocal participants in fishing tournaments. Local day visitors are estimated to spend \$55 per party per day, influenced by the relatively high operating costs of fishing boats and the entry fees associated with fishing tournaments. Total annual visitor spending was estimated at \$23.50 million in 2002.

The total direct contribution of recreation visitor spending is estimated at \$14.90 million. The difference between the total estimated spending of \$23.5 million and the direct contribution of \$14.9 million reflects adjustments made to discount spending for the value of products sold to visitors but produced outside the local economy.

The combined economic contributions of the direct NPS operations and those attributable to visitor spending total 512 jobs and \$10.2 million in personal income per year.

The economic contributions associated with Amistad will vary on a year-to-year basis in response to factors such as changing pool elevations, the number of fishing tournaments hosted, weather conditions, and changes in management and use policies, such as the temporary restriction on personal watercraft use implemented in late 2002. In general, the economic contributions would be expected to

increase as pool elevations increase because of improved water and shoreline accessibility. On the other hand, a higher pool elevation also means an increase in the volume of water stored with a possibility that the perceived quality of the fishery may diminish, which could adversely affect recreation use.

Other Dimensions of Amistad National Recreation Area's Economic Contributions

The sales, income, and job impacts of the NPS operations and visitor spending described above are perhaps the most obvious examples of the economic role that Amistad National Recreation Area plays in the local economy. However, those estimates do not fully capture the unit's importance. There are at least four other mechanisms by which Amistad National Recreation Area contributes to the local economy: (1) second/weekend homes, (2) the cooperative programs and links to the Seminole Canyon State Park and Historic Site and the Shumla School, (3) the educational and tourism promotion programs conducted by NPS staff in the community and aboard AMTRAK, and (4) the synergies developing between the Amistad National Recreation Area and the Texas Chapter of The Nature Conservancy's Dolan Reserve on the Devils River. The contributions associated with these mechanisms are not readily quantifiable, but can be described.

(1) Completion of the dam and filling of Lake Amistad helped stimulate the construction of numerous second and weekend homes near Amistad, e.g., Box Canyon Estates, Amistad Acres, Rough Canyon, and the Lake View area. Owners of those properties and their guests account for much of the recreation use at Amistad National Recreation Area.

(2) The Seminole Canyon State Park and Historic Site is along U.S. Highway 90, near the Pecos River Recreation Area on the Rio Grand arm of Lake Amistad. Seminole Canyon hosts some of North America's oldest

rock paintings and ancient shelters. The Shumla School, a non-profit experiential learning center, has become a major NPS partner in education and outreach programs. The school brings increasing numbers of visitors to the area to learn about the prehistoric life ways of the Lower Pecos region.

Although much smaller in size and visitation, fiscal year 2003 visitation was 54,277 visitors, and the Seminole Canyon State Park serves an important role in supporting the operations of Amistad National Recreation Area. The role stems from several sources: (a) Seminole Canyon Visitor Center is staffed during the day, thereby providing either a backup for first-response communications and emergency response capability; (b) a 31-space campground, with showers, toilets, and running water that hosts many visitors who will visit the national recreation area but who camp at the state facility; and, (c) cooperative interpretation and education programs between the two facilities and their respective staffs, which enhance the visitor experience. In fiscal year 2003, Seminole Canyon State Park reported hosting nearly 9,000 overnight guests, equivalent to 39% of the total overnight camping recorded at Amistad National Recreation Area.

(3) Amistad National Recreation Area staff conduct and participate in many educational and cultural programs in Del Rio and

elsewhere in the region. Some of these events and programs include a cooperative program with AMTRAK, the Trails and Rails program. Education and Resource Management staff and trained volunteers-in-parks conduct educational lectures and discussion aboard AMTRAK trains as they travel through the area, and at the Archeology Fair conducted in cooperation with the Whitehead Museum, the Shumla School, and local school district. These activities generate additional economic contributions to the local economy, attracting visitors to the area, or encouraging residents to spend more of their income locally.

(4) The Nature Conservancy (TNC) maintains and operates the 18,500-acre Dolan Falls Preserve. Straddling the Devils River on the northern border of Amistad National Recreation Area, Dolan Falls Preserve is considered one of the jewels of the TNC network of protected properties. Among the preserve's significant ecological features is that it is situated at the intersection of three biological regions — the Edwards Plateau, Chihuahuan Desert, and Rio Grande Plain brushland. The preserve is open to the public for schedule field trips and for volunteer workdays. Although the number of visitors to the Dolan Falls Preserve is limited, the publicity, awareness, and interactions, e.g., scientific research efforts, between the two facilities will provide another source of economic stimulus to the region.

VISITOR ACCESS AND TRANSPORTATION

U.S. Highways 90 and 277/377 pass through Amistad National Recreation Area and provide the primary highway access to the major visitor facilities, boat ramps, and recreation use areas. Local roads, state spur roads, and state recreational roads connect the two major highways to specific visitor use sites. Largely surrounded by private land, most of the national recreation area and its 540 miles of shoreline are accessible to the public only by boat.

Visitor demand for access to the national recreation area is higher with higher water levels and a greater number of operable boat launches. At high water levels (1,110 feet–1,117 feet) there are 19 boat launches available throughout the reservoir. Boat access to the water can be achieved from nearly any part of the national recreation area. Additionally, land-based access to the water for bank fishing or swimming is more dispersed as access becomes more available in areas such as 277 South and North, Spur 406, and Rough Canyon.

Visitor demand decreases as water levels decrease, and the majority of boat launches become unusable. At low water levels like those experienced between 1998 and 2002, access to the water was limited to four primary boat ramps — Diablo East, Rough Canyon, Box Canyon, Spur 454, and the Southwinds Marina. During these times available dry land for recreational use is more prevalent and opportunities for access to hiking, biking or

other land-based recreational opportunities increase. This increases demand for roadway or trails access on areas like the Cliffs at Diablo East or San Pedro to expand recreational access to a broader range of activities.

There are many modes used by visitors to the national recreation area. Access to recreational areas is primarily by motorized boat or car, but nonmotorized boats, foot travel, horseback, and bicycles are also used. With the exception of motorized boats, most of these modes allow for circulation within a specific area of the national recreation area but not easily throughout the entire national recreation area. In addition, there are very few circulation opportunities in the recreation area's boundaries due to the fact that the boundaries are defined by a topographic elevation. As a result, some visitor areas are separated from one another by portions of the reservoir with no direct land access between them. Visitors must leave the national recreation area and travel around the reservoir to the next site.

Foot and horse traffic is limited to specific areas of the national recreation area such as San Pedro; it is difficult to access other areas of the national recreation area without motorized transportation. Circulation throughout most of the national recreation area is fairly easy by powered boat; circulation of nonmotorized craft is feasible within specific areas of the reservoir such as Rough Canyon and Devils River.

NPS OPERATIONS AND FACILITIES

Amistad National Recreation Area's main visitor center and maintenance facility are located in the new leased visitor facility on Highway 90 W before Blackbrush, 5 miles west of Del Rio. Administrative functions are located in the headquarters building on 4121 Veterans Boulevard (Highway 90 W) in Del Rio.

The current permanent NPS staff of 34 includes 12 in the ranger division.

The main ranger station is at Diablo East. There are also ranger stations at Rough Canyon and at the Pecos River. The visitor center at Rough Canyon is staffed by volunteers on a part-time basis.

Environmental Consequences



INTRODUCTION

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. In this case the proposed federal action would be the adoption of a general management plan for Amistad National Recreation Area. This chapter contains analyses of the environmental effects on natural resources, cultural resources, the visitor experience, operations, and the socioeconomic environment that would result from implementing each alternative. The analysis is the basis for comparing the beneficial and adverse effects of implementing the alternatives.

Because the actions described in the alternatives are conceptual, the impacts of these actions are analyzed in general qualitative terms. Thus, this environmental assessment should be considered a programmatic analysis. If and when site-specific developments or other actions are proposed for implementation subsequent to this *General Management Plan*, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with the requirements of the National Environmental Policy Act and the National Historic Preservation Act.

This chapter begins with a description of the methods and assumptions used for each topic. Impact analysis discussions are organized by alternative and then by impact topic under each alternative. Each alternative discussion also contains a description of the cumulative impacts, along with a conclusion. At the end of each alternative is a brief discussion of unavoidable adverse impacts; irreversible and irretrievable commitments of resources; the relationship of short-term uses of the environment and the maintenance and the enhancement of long-term productivity, and energy requirements and conservation potential. The

impacts of each alternative are briefly summarized in table 5, beginning on page 69.

CUMULATIVE IMPACT ANALYSIS

A cumulative impact is described in regulation 1508.7 of the Council on Environmental Quality as follows:

‘Cumulative impact’ is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

To determine potential cumulative impacts, other projects in and surrounding Amistad National Recreation Area were identified. The area included the city of Del Rio, Val Verde County, and the state of Texas. Potential projects identified as cumulative actions were any planning or development activity that is being implemented or will be implemented in the reasonably foreseeable future. The effects of past actions also were considered in the analysis.

These actions were evaluated in conjunction with the impacts of each alternative to determine if they would result in any cumulative effects on a particular natural, cultural, or socioeconomic resource or on visitor use. Because most of these cumulative actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the project.

Past Actions

- the construction of Amistad Dam and the creation of Lake Amistad
- the creation of Seminole Canyon State Park and Historic Site
- the establishment of Rio Grande Wild and Scenic River
- North American Free Trade Agreement (NAFTA)

Present Actions

- the establishment of The Nature Conservancy's Devils River Conservancy Area
- the management of personal watercraft use
- increased homeland security and border interdiction activities

Future Actions

- The development of Laughlin Air Force Base Marina
- Continued urban development in Val Verde County

IMPAIRMENT OF NPS RESOURCES

In addition to determining the environmental consequences of implementing the preferred and no-action alternatives, *NPS Management Policies 2001* (section 1.4) requires the analysis of potential effects to determine whether or not proposed actions would impair national recreation area resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on resources and values. However, the laws do give the National Park Service the discretion to allow impacts on resources and

values when necessary and appropriate to fulfill the purposes of the park system unit, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the discretion to allow certain impacts, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of NPS resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (*NPS Management Policies 2001*, 1.4.5). An effect on any resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is (a) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park system unit, (b) key to the natural or cultural integrity of the park unit or to opportunities for its enjoyment, or (c) identified as a goal in the park unit's general management plan or other relevant NPS planning documents.

Impairment may result from NPS management activities, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park unit. A determination about impairment is made in the "Environmental Consequences" section in the conclusion section for each required impact topic related to resources and values. An evaluation of impairment is not required for topics related to visitor use and experience (unless the impact is resource-based), NPS operations, or the socioeconomic environment. When it is determined that an action(s) would result in a moderate to major adverse effect, a justification for nonimpairment is made. Impacts of only negligible or minor intensity by definition would not result in impairment.

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

HOW IMPACTS WERE ANALYZED

The planning team based the impact analysis and the conclusions in this chapter largely on the review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and national resource area staff insights and professional judgment. The team's method of analyzing impacts is explained further below. It is important to remember that all the impacts have been assessed assuming mitigating measures have been implemented to minimize or avoid impacts. If the mitigating measures described in chapter 2 were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

DO 12, "Conservation Planning, Environmental Impact Analysis, and Decision Making," presents an approach to identifying the duration (short-term or long-term), type (adverse or beneficial), and intensity or magnitude (negligible, minor, moderate, or major) of the impact(s), and that approach has been used in this document. Where duration is not noted in the impact analysis, it is considered long term. Direct and indirect effects caused by an action were considered in the analysis. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or farther removed from the place, but are still reasonably foreseeable.

The impact analyses for the no-action alternative compare resource conditions in the year 2019 to existing conditions in 2004, assuming continuation of the current management direction. The impact analyses for the preferred alternative compare the action alternative in the year 2019 to the no-action alternative in the year 2019. Said differently, the impacts of the action alternatives describe the *difference between* implementing the no-action alternative and implementing the

action alternative. To understand a complete "picture" of the effects of implementing the action alternative, readers must also consider the impacts that would occur under the no-action alternative.

NATURAL RESOURCES

The analysis of natural resources was based on research, knowledge of national recreation area resources, and the best professional judgment of planners, biologists, hydrologists, and botanists who have experience with similar types of projects. Information about the national recreation area's natural resources was gathered from several sources, including the U.S. Fish and Wildlife Service and site-specific resource inventories for wildlife, water quality, vegetation, and threatened and endangered species. As appropriate, additional sources of data are identified under each topic heading.

Where possible, map locations of sensitive resources were compared with the locations of proposed developments and modifications. Predictions about short-term and long-term site impacts were based on previous studies of the effects on natural resources resulting from visitors and the development of facilities.

The definitions below assume that mitigation would be implemented. For this document, the planning team qualitatively evaluated the impact intensity for natural resources as follows:

Negligible — The effects would be at the lowest levels of detection and would result in no appreciable effect on resources, values, or processes.

Minor — The effects would be perceptible but slight and localized. If mitigation was needed to offset any adverse effects, it

would be relatively simple to implement and probably would be successful.

Moderate — The effects would be readily apparent and widespread, and the action would result in a noticeable change in resources, values, or processes. Mitigative measures probably would be necessary to offset adverse effects, and they probably would be successful.

Major — The effects would be readily apparent and widespread, and the action would result in a substantial alteration or loss of resources, values, or processes. Mitigative measures to offset adverse effects would be necessary and extensive, and their success could not be guaranteed.

Soils

The following categories were used to evaluate the potential impacts on soils:

Negligible — The effect on soils would not be measurable. Any effects on productivity or erosion potential would be slight

Minor — The action would change a soil's profile in a relatively small area, but it would not appreciably increase the potential for the erosion of additional soil.

Moderate — The action would result in a change in the quantity or an alteration of the topsoil, overall biological productivity, or the potential for erosion to remove small quantities of additional soil. The changes to local ecological processes would be of limited extent.

Major — The action would result in a change in the potential for erosion to remove large quantities of additional soil or in alterations to topsoil and overall biological productivity in a relatively large area. Significant ecological processes would be

altered, and landscape-level changes would be expected.

Vegetation

The potential effects on vegetation were assessed qualitatively. Information about site-specific areas was gleaned from general documents such as the national recreation area's resource management plan, and the results of site-specific surveys were used. The following categories were used to evaluate the potential impacts on vegetation:

Negligible — The effects on vegetation (individuals and/or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be affected only slightly. Ecological processes and biological productivity would not be affected.

Minor — The action would not necessarily decrease or increase the area's overall biological productivity. It would affect the abundance or distribution of individuals in a local area but would not affect the viability of local or regional populations or communities.

Moderate — The action would result in a change in the overall biological productivity in a small area. It would affect a local population sufficiently to cause a change in its abundance or distribution, but it would not affect the viability of the regional population or communities. The changes to ecological processes would be limited.

Major — The action would result in a change in the overall biological productivity in a relatively large area. It would affect a regional or local population of a species sufficiently to cause a change in its abundance or in distribution to the extent that the population or communities would not be likely to return to its/their former level (adverse), or it would return to a

sustainable level (beneficial). Significant ecological processes would be altered.

Water Quality

The relationship of pollution sources to the existing water quality in Amistad National Recreation Area has not been sufficiently studied and modeled to quantitatively assess impacts. In addition, the potential impacts of the actions of the alternatives generally cannot be defined relative to site-specific locations. Consequently, the effects of the alternatives on water quality were assessed qualitatively, as follows:

Negligible — The action would have no measurable or detectable effects on water quality or on the timing or intensity of flows.

Minor — The action would result in measurable effects on water quality or the timing or intensity of flows. Water quality effects could be such things as increased or decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms.

Moderate — The action would result in a clearly detectable effect on water quality or on the timing or intensity of flows, and it potentially would affect organisms or natural ecological processes. Alternatively, an impact would be visible to visitors.

Major — The action would result in substantial effects on water quality or the timing or intensity of flows, and it could affect organisms or natural ecological processes. Alternatively, the effect would be easily visible to visitors.

Wildlife

Impacts on wildlife are closely related to the impacts on habitat. Evaluators considered

whether actions would be likely to displace some or all individuals of a species in the national recreation area or result in the loss or creation of habitat conditions needed for the viability of local or regional populations. Some effects on wildlife might be any change in roosting or foraging areas, food supply, protective cover, or distribution or abundance of species. The following categories were used to evaluate the potential impacts on wildlife:

Negligible — The action would cause no measurable effects on individuals, and the local populations would not be affected.

Minor — The action would not necessarily decrease or increase the area's overall biological productivity. It would affect the abundance or distribution of individuals in a local area but would not affect the viability of local or regional populations or communities.

Moderate — The action would affect a local population sufficiently to cause a minor change in abundance or distribution, but it would not affect the viability of the regional populations.

Major — The action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population would not be likely to return to its former level (adverse), or it would return to a sustainable level (beneficial).

Threatened or Endangered Species and Species of Concern

Through coordination with the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department, species of special concern were identified that generally are found in or near the national recreation area. Information about each species was assembled, including their preferred habitat, prey, and foraging areas. The staff of the national

recreation area then collected more specific information such as the absence or presence of each species within the boundaries of the national recreation area. For special status species, including federally listed species, the following impact intensities were used. These definitions are consistent with the language used to determine the effects on threatened and endangered species under section 7 of the Endangered Species Act.

No effect — The action would not affect the special status species or critical habitat.

Not likely to adversely affect — The action would be expected to result in discountable effects on a species or a critical habitat (that is, extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated), or it would be completely beneficial.

Likely to adversely affect — The action would result in a direct or indirect adverse effect on a species or critical habitat, and the effect would not be discountable or completely beneficial.

CULTURAL RESOURCES

Cultural Resources Listed or Eligible to Be Listed in the National Register of Historic Places

The potential impacts on cultural resources (archeological resources, prehistoric or historic structures, cultural landscapes, and traditional cultural properties) either listed in or eligible to be listed in the National Register of Historic Places were identified and evaluated in accordance with the regulations of the Advisory Council on Historic Preservation for implementing section 106 of the National Historic Preservation Act (36 CFR 800, *Protection of Historic Properties*). This was done by (a) determining the area of potential effects, (b) identifying cultural resources present in the area of potential effects that are listed in or

eligible for listing in the national register, (c) applying the criteria of adverse effect to affected resources, and (d) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of *adverse effect* or *no adverse effect* must be made for affected national register listed or eligible cultural resources. An *adverse effect* occurs whenever an impact would directly or indirectly alter any characteristic of a cultural resource that qualifies it for inclusion in the national register; for example, diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5(a)(1)). A determination of *no adverse effect* means there would be an effect, but the effect would not meet the criteria of an adverse effect; that is, it would not diminish the characteristics of the cultural resource that qualify it for inclusion in the national register (36 CFR 800.5(b)).

Thus, the criteria for characterizing the severity or intensity of the impacts on national register listed or eligible archeological resources, prehistoric or historic structures, cultural landscapes, and traditional cultural properties are the "section 106" determinations of effect: *adverse effect* or *no adverse effect*. A section 106 determination of effect is included in the conclusion section for each analysis of impacts on national register listed or eligible cultural resources.

Museum Collections

Museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens), which are generally ineligible for listing in the national register. The potential impacts on museum collections that are not traditional

cultural properties are described in terms of context (would the effects be site-specific, local, or even regional?), duration (would the effects be short term — less than one year, long term — one year or more, or permanent?) and intensity (would the degree or severity of effects be negligible, minor, moderate, or major?).

Museum Collections. The definitions of impact intensity for museum collections are as follows:

Negligible — The effect would be at the lowest levels of detection — barely measurable, with no perceptible consequences for museum collections, either adverse or beneficial.

Minor — **Adverse Effect:** The action would affect the integrity of a few items in the museum collection but would not degrade the usefulness of the collection for future research and interpretation. **Beneficial Effect:** The action would stabilize the current condition of the collection or its constituent components to minimize degradation.

Moderate — **Adverse Effect:** The action would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation. **Beneficial Effect:** The action would improve the condition of the collection or protect its constituent parts from the threat of degradation.

Major — **Adverse Effect:** The action would affect the integrity of most items in the museum collection and destroy its usefulness for future research and interpretation. **Beneficial Effect:** The action would secure the condition of the collection as a whole or its constituent components from the threat of further degradation.

VISITOR USE AND EXPERIENCE

Various aspects of visitor use and experience at Amistad National Recreation Area are considered in this analysis, including overall visitor access to the national recreation area, opportunities for recreational activities, visitors' ability to experience primary natural and cultural resources and their settings; the freedom to experience the resources at one's own pace, and opportunities for people with disabilities. The analysis is based on how visitor use and experiences would change with the way management zones were applied in the alternatives. The analysis is primarily qualitative rather than quantitative because the alternatives are conceptual.

- Visitors' ability to experience the national recreation area's primary natural and cultural resources, including their natural setting (vistas; natural sounds, smells and scenes, wildlife)
- Freedom to experience the national recreation area at one's own pace (degree of spontaneity, individual itinerary, ease of carrying personal belongings)
- Access to appropriate orientation and interpretive information
- Ease and quality of movement throughout the national recreation area (choice of travel mode, reliability, affordability, timeliness, availability of facilities, access to places of interest, convenience, minimal congestion, continuous system of connections)
- Personal mobility for people with disabilities
- Facilitation of high quality visitor opportunities (access to diverse recreation opportunities, potentially new recreation activities, tranquil, contemplative environments, place and pace different from everyday environment, opportunities for social interaction with family or friends, opportunities to meet new people)

- Visitor safety, both actual and perceived (vehicle-vehicle; vehicle-wildlife; vehicle-bicycle; vehicle-pedestrian; vehicle-horse; pedestrian/bicyclist-horse)

For analysis purposes, impact duration, intensities, and types for visitor experience impact topics have been defined as follows:

Duration

A short-term effect would last less than one year and would affect only one season's use by visitors. A long-term effect would last more than one year, and it would be more permanent.

Intensity

The impacts were evaluated comparatively between alternatives, with the no-action alternative used as a baseline for comparison with the action alternative. The intensities for effects on visitor use and experience are as follows:

Negligible — Visitors probably would be unaware of any effects associated with the implementation of the action.

Minor — Changes in visitor use and/or experience would be slight but detectable, would affect few visitors, and would not appreciably limit or enhance experiences identified as fundamental to the national recreation area's purpose and significance.

Moderate — Some characteristics of visitor use and/or experience would change, and it is likely that many visitors would be aware of the effects associated with implementing the action. Some changes to experiences identified as fundamental to the national recreation area's purpose and significance would be apparent.

Major — Multiple characteristics of the visitor experience would change, including

experiences identified as fundamental to the national recreation area's purpose and significance. Most visitors would be aware of the effects associated with implementing the action.

Type of Effect

Adverse effects are those that most visitors would perceive as undesirable. Beneficial effects are those that most visitors would perceive as desirable.

SOCIOECONOMIC ENVIRONMENT

The National Park Service applied logic, experience, professional expertise, and professional judgment to analyze the effects on the socioeconomic conditions resulting from each alternative. Economic data, historic visitor use data, expected future visitor use, and future developments in the national recreation area all were considered in identifying, discussing, and evaluating the expected effects.

The assessments of potential socioeconomic impacts were based on comparisons between the no-action alternative and the action alternative.

Duration

The evaluation of effects included an assessment of duration. Distinguishing between short-term and long-term duration was necessary to understand the extent of the identified effects. In general, short-term effects are temporary and typically are transitional effects associated with implementing an action (for example, effects related to construction activities), and they last for less than one year. Long-term effects on the socioeconomic environment may extend beyond one year, and they could be permanent (for example, operational activities).

Intensity

The intensities for effects on the socioeconomic environment are as follows:

Negligible — The effects on socioeconomic conditions would be below or at the level of detection. There would be no noticeable change in any defined socioeconomic indicators.

Minor — The effects on socioeconomic conditions would be slight but detectable.

Moderate — The effects on socioeconomic conditions would be readily apparent, and the action would result in changes to socioeconomic conditions on a local scale.

Major — The effects on socioeconomic conditions would be readily apparent, and the action would result in demonstrable changes to the socioeconomic conditions of the region.

Type of Effect

NPS policy calls for the effects of the alternatives to be characterized as beneficial, adverse, or indeterminate. For socioeconomic effects, few standards or clear definitions exist as to what changes are beneficial or positive and which are adverse or negative. For example, rising unemployment generally is perceived as adverse, and increases in job opportunities and average per capita personal income are considered beneficial. However, in many cases changes that some people view as favorable are seen as unfavorable by others. For example, the effect of growth on housing markets and values may be seen as favorable by construction contractors and many homeowners but as adverse by renters, local government officials, and community groups concerned with affordability.

Consequently, some social and economic effects resulting from the actions of the alter-

natives may be described in a manner that will allow individual reviewers to determine whether the effect would be beneficial or adverse (that is, the effect is indeterminate as to “type”).

VISITOR ACCESS AND TRANSPORTATION

Intensity

The intensities for effects on visitor access and transportation are as follows:

Negligible — The effects would not be detectable, and the action would cause no discernible effect on traffic flow or traffic safety.

Minor — The effects on traffic flow or traffic safety would be slightly detectable, but the action would not cause an overall effect on those conditions.

Moderate — The effects on traffic flow or traffic safety would be clearly detectable, and the action would have an appreciable effect on those conditions.

Major — The effects would be substantial, with a highly noticeable influence on traffic flow or traffic safety, and the action could permanently alter those conditions.

NPS OPERATIONS AND FACILITIES

The effects that the actions of the alternatives would cause on the following aspects of operations were evaluated:

- staffing, NPS infrastructure, visitor facilities, and services
- the operations of non-NPS entities, including concessioners, commercial permittees, partners, and volunteers

- the operations of other federal agencies (for example, the Department of Homeland Security)

In the analysis, the way that operations and facilities might vary under the different alternatives was considered. The analysis is qualitative rather than quantitative because the alternatives are conceptual. Consequently, professional judgment was used to reach reasonable conclusions about the intensity, duration, and type of each potential impact.

Duration

Short-term effects would last less than one year because construction generally is completed within a year; therefore, the effect would last only until all construction actions were completed. Long-term effects would extend beyond one year, and the action could cause a permanent effect on NPS operations.

Intensity

The intensities for effects on NPS operations and facilities are as follows:

Negligible — NPS operations would not be affected, or the effect would be at or below the lower levels of detection, and the ac-

tion would not cause an appreciable effect on NPS operations.

Minor — The effects would be detectable, but the action would not cause an appreciable effect on NPS operations.

Moderate — The effects on NPS operations would be readily apparent, and the action would result in a substantial change in NPS operations that would be noticeable to the staff and the public.

Major — The effects would be readily apparent, and the action would result in a substantial change in NPS operations that would be noticeable to the staff and the public, resulting in a situation markedly different from existing operations.

Type of Effect

Beneficial effects would be improvements in NPS operations or facilities. Adverse effects would occur if the action would negatively affect NPS operations or facilities and could hinder the staff's ability to provide adequate services and facilities to visitors and staff. Some effects could be beneficial for some operations or facilities and adverse or neutral for others.

IMPACTS OF IMPLEMENTING ALTERNATIVE A (NO ACTION)

NATURAL RESOURCES

Soils

Soil disturbance would be caused by ongoing maintenance such as road grading, revegetation, parking area repair, boat ramp repair and modification, and maintaining trails and campsites. These actions would be restricted to the minimum area required for rehabilitation. All the areas that would be affected by ongoing maintenance have been previously disturbed. Any additional development (including the visitor center, a maintenance facility, a curatorial facility, campsites, roads, or trails) would be sited in previously disturbed areas whenever possible. Construction in all cases would be preceded by surveys of natural and cultural resources. Resource monitoring would be conducted on all construction projects.

Wind and water erosion could increase temporarily in sites with soil disturbance until vegetation was reestablished in cleared areas. Work done in disturbed areas would cause minor long-term adverse impacts on soils.

Vehicle traffic in unpaved parking areas and near camping and picnicking sites would continue to compact soils, decrease permeability, and alter soil moisture, thereby increasing erosion and changes in the natural composition of vegetation. Foot traffic on trails and in hunting areas results in similar impacts — soil compaction and impacts on vegetation — but these activities would result in minor long-term adverse impacts because the numbers of hikers and hunters in the national recreation area is small.

Day trips and camping along the lakeshore could cause the compaction and erosion of soils, resulting in minor long-term adverse impacts on soils.

Development under this alternative would be concentrated in previously disturbed or developed areas. Many of these areas, such as boat ramps and parking areas, are hardened surfaces. Extending boat ramps to accommodate changing lake levels could cause minor permanent adverse impacts on soils.

Cumulative Impacts. Ranching and grazing have led to the erosion of soils as a result of the introduction of large numbers of nonnative species such as cattle and goats. The hooves of grazing animals had a far greater impact on soils than those of native species, and grazing resulted in the removal of native vegetation. This left soils exposed to erosion by wind and water. The construction of Amistad Dam, the creation of Lake Amistad, and the development of facilities for Amistad National Recreation Area all affected soils within the boundaries of the national recreation area. This alternative would contribute a long-term negligible adverse effect to the cumulative long-term moderate to major adverse impacts on soils.

Conclusion. Soil disturbance from ongoing maintenance and from repairing and upgrading roads, campgrounds, and other facilities would cause a long-term minor adverse effect on soils. The soil disturbance resulting from foot and vehicular traffic would cause minor long-term adverse impacts on soils. Wind and water soil erosion resulting from disturbance would be minor, adverse, and long term.

The national recreation area's soil resources would not be impaired by the actions of this alternative.

Vegetation

Vegetation would be disturbed by ongoing maintenance such as road grading, revegetation, and the upkeep of campsites and picnic

areas. Because most of these activities would be carried out over small previously disturbed areas, the long-term adverse impact would be negligible.

Clearing some vegetation could increase the relative abundance of plant species that invade disturbed areas. Some of these plants could be exotics. Because clearing would be done in small previously disturbed areas, the long-term adverse impact would be minor.

Cumulative Effects. Agricultural practices, including ranching and grazing, have greatly reduced native desert plants. The introduction of large numbers of nonnative species such as cattle and goats disrupted native plant populations. Plants have been affected by being displaced, and habitat has been lost through agricultural uses and the introduction of nonnative plants.

The construction of Amistad Dam and the subsequent creation of Lake Amistad greatly reduced areas for native vegetation. Fluctuating lake levels and a variety of recreational uses allowed the invasion of nonnative plants.

The development of private residences on private lands adjacent to the national recreation area also affected some native plant species. Ongoing vegetation management in the national recreation area would encourage the restoration of native plants.

The impacts on vegetation from ranching and grazing covered wide areas and were adverse. The impacts of past, current and anticipated future actions outside the national recreation area, in conjunction with the impacts of alternative A, would result in long-term moderate to major adverse impacts on vegetation. The actions of alternative A would contribute a small increment to the overall cumulative effect.

Conclusion. Ongoing maintenance and visitor use would affect vegetation by leading to changes in the relative abundance of species,

the death of some plants from the exposure of root systems, the trampling and death of some plants, and resultant changes in species composition. These adverse effects would be negligible to minor.

The vegetation in the national recreation area would not be impaired by the actions of alternative.

Water Quality

Adverse impacts on water quality at Amistad can result from power boat emissions, from runoff from boat ramps, roads, and parking lots, from accidental trash dumping and discharges of waste from houseboats and other watercraft, and from erosion from the lake-shore. These impacts would be more noticeable during periods of low water, when the surface area of the reservoir is smaller and discharges of waste and trash would be less dispersed.

Heavy flow from the Rio Grande could transport additional sediment and pollutants from agricultural use into Amistad Reservoir. However, water circulation from the reservoir to answer downstream demands is frequent enough to mitigate the impacts of this inflow. Under alternative A, these actions would result in an intermittent negligible to minor long-term adverse impact on the water quantity at Amistad Reservoir.

Cumulative Effects. The construction of Amistad Dam and the subsequent creation of Amistad Reservoir profoundly altered the riparian areas of the Devils River, Pecos River, and the Rio Grande. For miles along the Devils River and the Rio Grande, riparian areas were permanently inundated. Riparian areas along the upper stretches of these streams and along the Pecos River are subject to periodic inundation.

Agriculture, including ranching and grazing, along with urban development adjacent to the

reservoir, affected the water quality of Lake Amistad and its tributaries through increased erosion and sedimentation in the lake. Waste products resulting from increased industrialization in Mexico also may contribute to pollution in the lake. Future development — including residential, commercial and transportation development — could contribute to lake pollution.

It is expected that long-term minor adverse impacts would result from past impacts on the water quality in Lake Amistad and in the Rio Grande and its tributaries. This would happen along with current and anticipated future actions outside the national recreation area, in conjunction with the effects of alternative A. The level and intensity of this impact is contingent on fluctuating lake levels.

Conclusion. Alternative A would result in long-term intermittent negligible to minor adverse impacts on water quality.

The resources and values of Amistad National Recreation Area would not be impaired by the actions of alternative A.

Wildlife

Alternative A would result in some wildlife disturbance caused by ongoing maintenance such as road grading, upgrading or repairing picnic areas and lakeshores, and by revegetation activities.

Wildlife habitat would continue to be fragmented by roads, trails, facilities, and fluctuating lake levels. Wildlife habits and movement still would be altered by employees and visitors. Visitor activity in campgrounds, on the lakeshore, or in semiprimitive or primitive areas could disturb wildlife and degrade habitat. These long-term intermittent adverse impacts would be negligible to minor.

Visitors to less-used sites such as the upper Devils and Pecos Rivers and the Rio Grande

could cause intermittent minor disruption of wildlife. This long-term intermittent adverse impact would be negligible.

Vehicle traffic would continue to cause a relatively low incidence of disruption of wildlife, resulting in a negligible intermittent adverse impact.

Cumulative Effects. Ranching, grazing, and increased urban and suburban development have greatly reduced native desert animals and habitat. These actions have reduced native vegetation and allowed nonnative plants to invade, degrading the habitat for some wildlife and improving it for others. Some animal species have been affected by being displaced and killed as vermin, and habitat has been lost through agricultural uses and the introduction of nonnative animals.

The construction of Amistad Dam and the subsequent creation of Lake Amistad reduced the amount of habitat in the valleys of the Devils and Pecos Rivers and the Rio Grande. Infrastructure, including roads, has increased human activity and has degraded and fragmented wildlife habitat in some areas.

The development of some private lands outside the national recreation area for residential use could alter wildlife habitat and habits and cause the loss of wildlife in some areas. Road kill of rodents, larger mammals, and birds would increase because more development probably would increase traffic.

The past impacts of ranching on wildlife, including the encroachment of domestic livestock on wildlife habitat, covered wide areas and were adverse. The past impacts of creating developments, including roads, to facilitate visitor use covered smaller areas, occupied and fragmented habitat, and were adverse. Impacts on wildlife from current and anticipated future actions outside the national recreation area, in conjunction with the effects of alternative A, would be minor to moderate, long term, and adverse. Most impacts

would result from development actions outside the national recreation area, which might or might not be mitigated. The actions of alternative A would contribute only a small increment to the overall cumulative impact, which would be long term, minor to moderate, and adverse.

Conclusion. Overall, the fragmentation of wildlife habitat and the alteration of wildlife movement resulting from this alternative would continue to cause a long-term minor adverse impact.

The national recreation area's wildlife resources would not be impaired by the actions proposed under alternative A.

Threatened or Endangered Species and Species of Concern

Threatened and endangered species and species of concern could be affected by recreational uses such as boating, camping, fishing, and hunting, which might affect habitat for these species. The only endangered species known to inhabit the national recreation area, the interior least tern, nests on several islands in the reservoir. There is the potential for boaters or picnickers to intrude on these island habitats during the nesting season, but no incidents of willful trespass in these areas have been recorded. The islands are closed to visitors during nesting periods. The national recreation area has enough islands and shoreline for visitors to use that they are not affected by the closures, and they do not seem to mind the closures. Under alternative A, visitor activities would be unlikely to cause adverse effects on this species or its nesting habitat.

Other threatened species and species of concern could potentially be affected by fishing, boating, hunting, camping, and picnicking. However, available data indicate that few, if any, federally listed or state-listed threatened, endangered, or special concern species inhabit lands within the boundaries of the national

recreation area. Therefore, it is unlikely that visitor activities would adversely affect threatened, endangered, and special concern species over the long term.

Cumulative Effects. Agriculture, including ranching and grazing, have greatly reduced native desert plants and animals, including threatened and endangered species. Other actions such as the construction of Amistad Dam and the subsequent creation of Lake Amistad, road construction, and increased residential development have disrupted or reduced habitat for these species.

Major adverse impacts on threatened and endangered species were caused in the past by ranching and grazing, dam and reservoir construction, road construction, residential development, and the development of NPS infrastructure. Current and future actions outside the national recreation area could affect threatened and endangered species. Increasing population growth and urbanization could further reduce habitat for these species. The actions of alternative A would contribute a negligible long-term adverse component to the impacts of past, present, and anticipated future actions outside the national recreation area.

Conclusion. Overall, alternative A would result in a long-term negligible adverse impact on threatened, endangered, and special concern species.

Threatened and endangered species and species of concern in the national recreation area would not be impaired by the actions of this alternative.

CULTURAL RESOURCES

Archeological Resources

The Lower Pecos River archeological region encompasses an area of about 50 square miles along the United States–Mexico border in

southwestern Texas. Amistad National Recreation Area is in or adjacent to this rich archeological region.

Impacts on archeological sites and rare rock art could result from a variety of visitor activities related to recreational use — boating, fishing, hunting, camping, and hiking. Wave action from power boating could erode exposed archeological sites. Resources could be trampled by people who trespass on archeological sites. Vandalism and theft also could cause adverse impacts.

Trampling by unauthorized livestock grazing and exotic game species that have migrated into the national recreation area also could affect archeological resources, causing long-term minor adverse impacts. Continuing survey work to identify archeological resources would result in a long-term minor to moderate beneficial effect on archeological resources, as would preserving archeological resources as time and funding would permit. Continued management efforts to educate the public about the sensitive nature of these resources would minimize the potential for impacts. Actions to prevent unauthorized grazing and eliminate exotic game species would minimize the impacts on archeological resources associated with these actions.

Cumulative Effects. The archeological resources at Amistad National Recreation Area are subject to damage from development, vandalism, illegal activities, grazing, and natural processes. Past actions such as the construction of Amistad Dam and the subsequent creation of Amistad Reservoir resulted in the loss of archeological resources, a long-term major adverse impact. Ranching and grazing, road construction, residential development, and the development of NPS infrastructure have caused adverse impacts on archeological resources in and adjacent to the national recreation area. This alternative would add a long-term negligible to minor adverse component to the cumulative impacts on archeological resources.

Conclusion. Alternative A would result in long-term minor adverse impacts on archeological resources. The ongoing efforts to identify and protect archeological resources would result in a long-term minor to moderate beneficial effect on archeological resources. Limited staff and funding for such work would keep these effects minor to moderate.

The resources and values of Amistad National Recreation Area would not be impaired because there would be no major adverse impacts on a resource or value whose conservation is (a) necessary to fulfill specific purposes identified in its establishing legislation or proclamation, (b) key to its natural or cultural integrity or to opportunities for its enjoyment, or (c) identified as a goal in its general management plan or other relevant NPS planning documents. Therefore, no archeological resources would be impaired by implementing alternative A.

Museum Collections

Continued work on reducing the backlog of uncatalogued collections materials would result in a long-term minor to moderate beneficial effect on the collections. Expanding museum space for artifact displays could cause long term negligible adverse impacts resulting from deterioration caused by exposure of the resources to air, humidity, and light. Appropriate environmental controls would minimize the adverse impacts resulting from exposure to these physical conditions.

Cumulative Effects. The collections at Amistad National Recreation Area are subject to damage and deterioration from vandalism, theft, and natural processes. Constructing new facilities for collections management would add more space for the collections, resulting in better care of the collections. The negligible to minor beneficial effects of this alternative, in conjunction with the minor beneficial effects of other reasonably foreseeable future

actions, would result in minor beneficial effects on collections.

Seminole Canyon State Park and Historic Site has the only exhibits of historic objects in the region. The NPS staff would continue to preserve and interpret cultural resources. This work could result in making more collection materials available to the public and researchers. These actions would result in long-term minor beneficial effects on collections in the region.

Conclusion. Alternative A would result in a long-term minor beneficial effect on the national recreation area's museum collections. New collections management facilities would better protect and preserve the collections and enhance the opportunities to display, curate, and access the collections. This alternative would result in a long-term minor to moderate beneficial effect on the collections.

The national recreation area's collections would not be impaired by actions proposed under this alternative.

VISITOR USE AND EXPERIENCE

Visitors' Experiences of the Resources

The visitor experience at Amistad National Recreation Area would continue to be characterized by a wide range of recreational and educational opportunities, including fishing, boating, hunting, camping, picnicking, hiking, and looking at archeological resources. Opportunities for nonmotorized boating would remain at current levels. The number of bass fishing tournaments would remain at current levels. Hunting would continue, but hunting areas would not be expanded, and additional methods for hunting would not be considered. Camping and picnicking areas would remain in their current conditions. The hiking trails would not be expanded substantially, nor would the interpretive and educational programs.

The visitor center would be improved under this alternative. Some modifications would be made to existing boat ramps to improve access to the lake during periods of low water. Access for the nonboating public would not substantially improve under this alternative. Few provisions would be made to improve access to the lakeshore for swimmers and shore fishermen. Improvements to the visitor center and modifications of the facilities would result in a long-term negligible to minor beneficial effect on visitors' experiences of the resources.

Visitor Safety

Visitor safety would remain a priority for the staff. Safety education programs for boaters and other water sports enthusiasts would continue. Increases in the ranger division at Amistad would help ensure a safe experience for all visitors and minimize the potential for accidents and injuries.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad essentially established the foundation for the current range of recreational activities at Amistad National Recreation Area. The establishment of Seminole Canyon State Park and Historic Site helped to enhance the potential for visitor understanding and appreciation of the cultural resources of Amistad and the Lower Pecos River region. Its ongoing operation would continue to serve that function. Reasonably foreseeable future actions that would cause a perceptible effect on the visitor experience could include population growth in Val Verde County and a corresponding increase in demand on Amistad's recreational and educational resources. Implementing the no-action alternative would add a long-term minor beneficial component to long-term moderate beneficial cumulative impacts on the visitor experience.

Conclusion

Alternative A would result in long-term minor to moderate beneficial effects on visitor understanding and the visitor experience. The actions of this alternative would not constitute impairment of the national recreation area's resources.

SOCIOECONOMIC ENVIRONMENT

Analysis

Amistad National Recreation Area is on the outskirts of the city of Del Rio in Val Verde County. This is one of the largest counties in Texas in area, but it has a relatively small population. Most of that population is concentrated in Del Rio. Recreational use of the reservoir directly and indirectly has a measurable influence on the economy of Del Rio and Val Verde County. The national recreation area is the major travel and tourist attraction in the region, drawing an average of more than 1,000,000 visitors yearly. It is assumed that this level of visitation will rise in the future at a rate proportional to the increase in regional populations.

Visitor spending in the local economy totaled \$23.5 million in 2002. NPS operations contributed an additional \$3.5 million to the local economy. NPS operations and visitor-related services combined to add more than 500 jobs to the economies of Del Rio and Val Verde County. Other economic effects related to the national recreation area resulted from the construction of second or weekend homes, cooperative programs with Seminole Canyon State Park and Historic Site, and NPS-sponsored educational and interpretive programs, which enhance opportunities for regional tourism.

Because the no-action alternative would involve continuing existing trends in the national recreation area, the current baseline socioeconomic effects and benefits to the

local and regional economy would continue. There would be some change in direct employment in the ranger division and only minimal growth in related private sector employment serving visitors or other service sectors. This alternative would include funds for constructing a new visitor facility and the rehabilitation of other facilities to maintain the current programs and levels of service. There would be both direct and indirect long-term minor beneficial effects from continuing existing practices at the national recreation area.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad established the recreational opportunities and corresponding effect that the national recreation area has on the local economy. Continued residential development adjacent to and stimulated by the presence of the reservoir would contribute to economy of Del Rio and the county. The actions of alternative A would add a long term negligible to minor beneficial component to the cumulative long term moderate beneficial effects on the regional economy.

Conclusion

The existing benefits of the national recreation area to the local and regional economy would continue. There would be both direct and indirect long-term minor beneficial effects from continuing existing practices at Amistad.

VISITOR ACCESS AND TRANSPORTATION

Analysis

Under the no-action alternative, long-term minor to moderate adverse impacts on

transportation and visitor access to the national recreation area would result from increased demand on the recreation area's resources and increased visitor use. These impacts would include increased crowding and potential visitor conflicts at boat launch sites and campgrounds. Minor improvements to boat launch sites and other elements of the infrastructure would mitigate the impacts on transportation and access resulting from increased use. However, the no-action alternative would not result in substantial improvement to the transportation infrastructure or other elements related to visitor access.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad established the recreational opportunities that attract local and regional visitors. Continued population growth in the city of Del Rio and Val Verde County will place additional demands on these resources. Regional highway development could improve visitor access to the national recreation area. Alternative A would add a minor component to the cumulative long-term minor beneficial effects on transportation and visitor access.

Conclusion

Alternative A would result in a long-term minor to moderate adverse impact on transportation and visitor access.

NPS OPERATIONS, FACILITIES, AND CONCESSIONS

Analysis

Improvements to operations and facilities would be limited under the no-action alternative. Visitor and maintenance facilities would remain in the current leased building, and no new visitor center would be con-

structed. Improvements would be made to operations relating to border security and visitor safety. Limited improvements would be made to national recreation area facilities at some boat launch sites, which would improve NPS operations. The actions of alternative A would cause long-term negligible to minor beneficial effects on operations and facilities.

Concession activities would remain at their current level under alternative A. Some concession operators would relocate their operations to improved and expanded facilities at Box Canyon. This would result in a long-term minor to moderate beneficial effect on concession operations.

Cumulative Effects

There would be no cumulative impacts on NPS operations or concessions under alternative A.

Conclusion

Alternative A would result in long-term minor beneficial effects on NPS Operations.

Alternative A would cause long-term minor to moderate beneficial effects on concession operations.

UNAVOIDABLE ADVERSE IMPACTS

There would be no unavoidable adverse impacts from alternative A.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

There would be no irreversible or irretrievable commitments of resources under alternative A.

RELATIONSHIPS OF SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Continuing recreational visitor activities would not reduce the long-term productivity of the natural and cultural environment of Amistad National Recreation Area. (In this context, *productivity* refers to retaining the resources and values that led to the creation of Amistad as a unit of the national park system.) Human activities associated with ongoing visitor and administrative use of the national recreation area (such as fishing, boating, hunting, hiking, wildlife observation, and enjoying archeological resources) would not cause unacceptable adverse impacts on wildlife, habitat, water quality, threatened and endangered species, or cultural resources. The limited development under the no-action

alternative would not affect the long-term productivity of these resources.

Continuing recreational use, visitor activities, and planned facility improvements under alternative A would improve the long-term productivity of the socioeconomic environment over the both the short term and the long term.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Alternative A would require a greater amount of energy than alternative B because the existing visitor and administrative facilities are less energy-efficient than newly constructed like facilities would be. Designing all structures to be energy-efficient could mitigate the additional energy requirements.

IMPACTS OF IMPLEMENTING ALTERNATIVE B (PREFERRED)

NATURAL RESOURCES

Soils

Under the preferred alternative, soils would be disturbed by ongoing maintenance activities such as road grading, revegetation, parking area repair, boat ramp repair and modification, and maintenance of trails and campsites. Constructing the new visitor and maintenance facilities would result in some short-term impacts on soils. Wind and water erosion could increase temporarily on sites with soil disturbance until vegetation was reestablished in cleared areas. Work done in disturbed areas would result in minor long-term adverse impacts on soils.

Vehicle traffic in unpaved parking areas and near campsites and picnic sites would continue to compact soils, decrease permeability, and alter soil moisture, thereby increasing erosion and changes in the natural composition of vegetation. Foot traffic on trails and in hunting areas would result in soil compaction and affect vegetation. These adverse impacts would be minor and long-term because the numbers of hikers and hunters in the national recreation area would be small.

Day trips and camping along the lakeshore could compact and erode soils, a minor long-term impact on soils.

Improvements to roads inside the boundary of the national recreation area could cause some short-term and long-term impacts on soils.

Developments under the preferred alternative would be concentrated in previously disturbed or developed areas. Many of these areas, such as boat ramps and parking areas, are hardened surfaces. Extending boat ramps to accommodate changing lake levels could

result in minor permanent adverse impacts on soils.

Cumulative Impacts. Ranching and grazing have led to the erosion of soils as a result of the introduction of large numbers of nonnative species such as cattle and goats. The hooves of grazing animals have a far greater impact on soils than those of native species, and grazing has resulted in the removal of native vegetation. This has left soils exposed to erosion by wind and water. The actions of alternative B could contribute a negligible long-term adverse impact to the cumulative long term moderate to major adverse impact on soils.

Conclusion. Soil disturbance from ongoing maintenance, road repair and upgrading, the use of campgrounds, and the construction of the new visitor and maintenance facilities would cause minor long-term adverse impacts on soils. Soils would be disturbed by foot and vehicular traffic, a minor long-term adverse impact. Disturbed soils would be eroded by wind and water, a minor long-term adverse impact.

The soil resources of Amistad National Recreation Area would not be impaired by the actions of alternative B.

Vegetation

Under the preferred alternative, vegetation would be disturbed by ongoing maintenance such as road grading, revegetation, and the upkeep of campsites and picnic areas. Because most of these activities would be done in small, previously disturbed areas, this adverse impact would be negligible.

Clearing some vegetation could increase the relative abundance of plant species that invade disturbed areas. Some of these could be

exotics. Increased erosion at these areas could expose the root systems of some plant species. Because clearing would be done in small, previously disturbed areas, this adverse effect would be minor and long term. Increased efforts to control exotic plant species, including cooperative efforts with other federal and state agencies and the Nature Conservancy, would further limit the spread of exotic species. Reducing trespass grazing and exotic game species also would reduce the impacts on vegetation.

Cumulative Effects. Ranching and grazing have greatly reduced native desert plants. The introduction of large numbers of nonnative species such as cattle and goats has disrupted native plant populations. Plants have been affected by being displaced, and habitat has been lost through agricultural uses and the introduction of nonnative plants.

The construction of Amistad Dam and the subsequent creation of Lake Amistad greatly reduced areas for native vegetation. Fluctuating lake levels and a variety of recreational uses have allowed nonnative plants to invade the area.

The development of private residences on private lands adjacent to the national recreation area has affected some native plant species. Ongoing vegetation management in the national recreation area would make it possible to restore native plants.

The impacts of ranching and grazing on vegetation covered wide areas and were adverse. The impacts of past, current and anticipated future actions outside the national recreation area, in conjunction with the effects of alternative B, would result in moderate long-term adverse impacts on vegetation.

Conclusion. Ongoing maintenance and visitor use would affect vegetation by leading to changes in the relative abundance of species, the death of some plants from the

exposure of root systems, the trampling and death of some plants, and the resultant changes in species composition. These would be negligible to minor long-term adverse effects.

Ongoing and expanded vegetation management could cause long-term moderate beneficial effects on some plant species.

The vegetation resources of the national recreation area would not be impaired by the actions of alternative B.

Water Quality

Impacts on water quality at Amistad can result from powerboat emissions, runoff from boat ramps, roads, and parking lots, accidental trash dumping, the discharge of waste from houseboats and other watercraft, and erosion from the lakeshore. These impacts would be more noticeable during periods of low water.

Heavy flow from the Rio Grande could transport additional sediment and pollutants from agricultural use into Amistad Reservoir. Under alternative B, these actions would result in an intermittent negligible to minor long-term adverse impact on the water quantity at Amistad Reservoir.

Cumulative Effects. The construction of Amistad Dam and the subsequent creation of Amistad Reservoir profoundly altered the riparian areas of the Devils River, Pecos River, and the Rio Grande.

Agriculture, including ranching, and grazing and urban development adjacent to the reservoir also have affected the water quality of Lake Amistad and its tributaries. Waste products resulting from increased industrialization in Mexico also may contribute to pollution in the lake.

Past impacts on the water quality of Lake Amistad and its tributaries in the Rio Grande

caused by current and anticipated future actions outside the national recreation area, in conjunction with the impacts of alternative B, would be minor, long term and adverse. The level and intensity of this impact would be contingent upon fluctuating lake levels.

Conclusion. Intermittent negligible to minor long-term adverse impacts on the water quality at Lake Amistad would result from the preferred alternative.

The resources and values of Amistad National Recreation Area would not be impaired because there would be no major adverse impacts on a resource or value whose conservation is (a) necessary to fulfill specific purposes identified in its establishing legislation or proclamation, (b) key to its natural or cultural integrity or to opportunities for its enjoyment, or (c) identified as a goal in its general management plan or other relevant NPS planning documents. Therefore, no water quality would be impaired by implementing alternative B.

Wildlife

Some wildlife would be disturbed under alternative B because of ongoing maintenance such as road grading, upgrading repairing picnic areas and lakeshore, and revegetation. There would be no change in the amount of wildlife habitat in the national recreation area under alternative B.

Wildlife habitat would continue to be fragmented by roads, trails, facilities, and fluctuating lake levels. Wildlife habits and movement would continue to be altered by employees and visitors. Visitor activity in campgrounds, on the lakeshore, or in semiprimitive or primitive areas could disturb wildlife and degrade habitat. These intermittent adverse impacts would be negligible to minor and long term.

Visitors to less-used sites such as the upper Devils and Pecos Rivers and the Rio Grande could cause intermittent minor disruption of wildlife. This intermittent adverse impact would be negligible and long term because visitation to these areas would be limited in numbers and of short duration.

Vehicle traffic would continue to cause a relatively low incidence of disruption of wildlife, resulting in a negligible intermittent adverse impact.

Cumulative Effects. Ranching and grazing and increased urban and suburban development have greatly reduced native desert animals and habitat. Native vegetation has been reduced and nonnative plants have invaded the area, degrading habitat for some wildlife and improving it for others. Some animal species have been affected by being displaced and killed as vermin, and habitat has been lost through agricultural uses and the introduction of nonnative animals.

The construction of Amistad Dam and the subsequent creation of Lake Amistad reduced the amount of habitat in the valleys of the Devils and Pecos Rivers and the Rio Grande. Infrastructure, including roads, has increased human activity and has degraded and fragmented wildlife habitat in some areas.

The development of some private lands outside the national recreation area for residential use could alter wildlife habitat and habits and cause the loss of wildlife in some areas. Road kill of rodents, larger mammals, and birds would increase because more development probably would increase traffic.

The past impacts of ranching on wildlife covered wide areas and were adverse. The past effects of creating developments, including roads, to facilitate visitor use covered smaller areas, occupied and fragmented habitat, and were adverse. Minor to moderate long-term adverse effects on wildlife would result from current and anticipated future actions outside

the national recreation area, in conjunction with the impacts of alternative B. Most of the impacts would be the result of development actions outside the national recreation area, which might or might not be mitigated. The actions of alternative B would contribute a small increment to the overall cumulative adverse impact.

Conclusion. Overall, the fragmentation of wildlife habitat and the alteration of wildlife movement resulting from the preferred alternative would continue to cause a long-term minor adverse impact.

The wildlife resources of the national recreation area would not be impaired by the actions of alternative B.

Threatened or Endangered Species and Species of Concern

Impacts on threatened and endangered species and species of concern could result from recreational uses such as boating, camping, fishing, and hunting, which might affect habitat for these species. The only endangered species known to inhabit the national recreation area, the interior least tern, nests on several islands in the reservoir. There is the potential for boaters or picnickers to intrude on these island habitats during the nesting season, but no incidents of willful trespass in these areas have been recorded. The islands are closed to visitor access during nesting periods. Increased educational and interpretive emphasis on natural resources and the importance of wildlife habitat will reduce the potential for impacts on these areas and increase public awareness of and support for the national recreation area's efforts to protect and preserve the terns' nesting areas. Under alternative B, visitor activities would result in a long-term negligible adverse impact on this species and its nesting habitat.

Other threatened species and species of concern could be affected by fishing, boating, hunting, camping, and picnicking. However,

available data indicate that few, if any, federally listed or state-listed threatened, endangered, or special concern species inhabit lands within the boundaries of the national recreation area. The implementation of indicators, standards, and monitoring of user capacity visitor activities in and around least tern nesting sites and habitat. Therefore, visitor activities under alternative B would result in a long-term negligible adverse effect on threatened, endangered, and special concern species.

Cumulative Effects. Agricultural activities, including ranching and grazing, have greatly reduced native desert plants and animals, including threatened and endangered species. Other actions such as the construction of Amistad Dam and the subsequent creation of Lake Amistad, road construction, and increased residential development have disrupted or reduced habitat for these species.

The past effects on threatened and endangered species from ranching and grazing, dam and reservoir construction, road construction, residential development, and the development of NPS infrastructure have been major and adverse. The effects on threatened and endangered species from current and anticipated future actions outside the national recreation area, such as increasing population growth and urbanization, could further reduce habitat for these species. The actions of alternative B would contribute a negligible long-term adverse component to the impacts of past, present, and anticipated future actions outside the national recreation area.

Conclusion. Overall, alternative B would cause negligible long-term adverse impacts on threatened, endangered, and special concern species.

The national recreation area's threatened and endangered species and species of concern would not be impaired by the actions of alternative B.

CULTURAL RESOURCES

Archeological Resources

Analysis. Adverse effects on the archeological resources of the national recreation area could result from a variety of visitor activities related to recreational use of the area such as boating, fishing, hunting, camping, hiking, and horseback riding. Wave action from power boating has been demonstrated to erode exposed archeological sites. Resources could be trampled by trespass on archeological sites. Vandalism and theft also could cause adverse impacts. More visitor access under alternative B might result in increased adverse impacts.

Trampling by unauthorized grazing livestock and exotic game species that have migrated into the national recreation area also could affect archeological resources. Under Alternative B, these actions would result in long-term minor adverse impacts on archeological resources. Increasing visitor awareness of these resources through educational and interpretive programs would reduce the potential of adverse impacts. Continuing survey work to identify archeological resources and preserving archeological resources as time and funding permit would cause a long-term minor to moderate beneficial effect on archeological resources. Actions to prevent unauthorized grazing and eliminate exotic game species and the introduction of indicators and standards for user capacity would minimize effects on archeological resources associated with these actions.

Cumulative Effects. Archeological resources at Amistad National Recreation Area are subject to damage from development, vandalism, illegal activities, and natural processes. Past actions such as the construction of Amistad Dam and the subsequent creation of Amistad Reservoir resulted in the loss of some archeological resources. Ranching and grazing, road construction, residential development, and the development of NPS infrastructure may have adversely affected archeological re-

sources in and adjacent to the national recreation area. Many reasonably foreseeable future actions, such as constructing new visitor, administrative, and maintenance facilities also could adversely affect archeological resources.

New development would not be placed in areas containing significant resources. The long-term negligible to minor adverse impacts from the actions of this alternative, in conjunction with the adverse impacts of other reasonably foreseeable future actions, would result in negligible to minor adverse impacts on archeological resources.

Conclusion. Long-term minor adverse impacts on archeological resources would result from the actions of alternative B. The ongoing efforts to identify and protect archeological resources would result in long-term minor to moderate beneficial effects on archeological resources. The implementation of indicators, standards, and monitoring of user capacity would minimize impacts associated with visitor activities in and around resource sites. Limited staff and funding for such work would keep these effects at minor to moderate levels.

The resources and values of Amistad National Recreation Area would not be impaired because there would be no major adverse impacts on a resource or value whose conservation is (a) necessary to fulfill specific purposes identified in its establishing legislation or proclamation, (b) key to its natural or cultural integrity or to opportunities for its enjoyment, or (c) identified as a goal in its general management plan or other relevant NPS planning documents. Therefore, no archeological resources would be impaired by implementing alternative B.

Museum Collections

Analysis. Continued work on reducing the backlog of uncatalogued collections materials would result in a long-term minor to

moderate beneficial effect on the collections. Expanded educational and interpretive programs under this alternative could result in larger artifact displays, causing long term negligible adverse impacts from deterioration caused by exposing resources to air, humidity, and light.

A new visitor and administrative center would contain improved museum and curatorial space, which would minimize impacts resulting from the increased display of the artifacts. Improved storage facilities would reduce the potential for impacts on the collections.

Cumulative Effects. The collections at Amistad National Recreation Area are subject to damage and deterioration from vandalism, theft, and natural processes. Reasonably foreseeable future actions such as building new facilities for collections would increase the space for the collections, resulting in better care of the collections. The moderate beneficial effects from the actions of this alternative, in conjunction with the minor beneficial effects of other reasonably foreseeable future actions, would result in minor to moderate beneficial effects on the collections.

Seminole Canyon State Park and Historic Site would continue to preserve and interpret cultural resources. This work could make more collection materials available to the public and researchers. These actions would result in long-term minor beneficial effects on collections in the region.

Conclusion. New collection facilities in the visitor and administrative center would better protect and preserve the national recreation area's collections and enhance opportunities to display, curate, and access the collections. This alternative would result in a long-term minor to moderate beneficial effect on the collections.

The national recreation area's collections would not be impaired by the actions of alternative B.

VISITOR USE AND EXPERIENCE

Visitors' Experience of the Resources

Under alternative B the visitor experience would be characterized by a wide range of recreational and educational opportunities, including fishing, boating, hunting, camping, picnicking, hiking, and seeing archeological resources. There would be more opportunities for nonmotorized boating. The number of bass fishing tournaments could be expanded, depending on water levels and available data on fish populations. Hunting would continue in the national recreation area. Hunting areas could be expanded, depending on water levels and methods of harvest. Camping and picnicking areas also could be expanded, depending on lake levels. The hiking trails also could be expanded to afford better access to archeological sites during periods of low water. Interpretive and educational programs would be expanded to address Amistad's diverse base and its role in the natural and cultural history of the Lower Pecos River and Rio Grande valleys.

A new visitor and administrative facility would be developed under the preferred alternative. Existing boat launch sites would be improved and modified to allow access to the lake during periods of low water. Access for the non-boating public would also be improved under this alternative. Provisions would be made to improve access to the lakeshore for swimmers and shore fishermen.

These actions would result in a long-term moderate to major beneficial effect on visitors' experience of the national recreation area's resources.

Visitor Safety

Visitor safety would remain a priority for the NPS staff. Safety education programs for boaters and other water sports enthusiasts would continue.

Increases in the ranger division at Amistad and the development of improved law enforcement facilities would help ensure a safe experience for all visitors and minimize the potential for accidents and injuries. This would result in a long-term moderate beneficial effect on visitor safety.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad made possible the current range of recreational opportunities at Amistad National Recreation Area. The establishment of Seminole Canyon State Park and Historic Site enhanced the potential for visitor understanding and appreciation of the cultural resources of Amistad and the lower Pecos River region. Its ongoing operation and increased cooperation with the National Park Service would expand opportunities for visitors to understand and appreciate the natural and cultural history of the region. Reasonably foreseeable future actions that would result in a perceptible effect on the visitor experience could include population growth in Val Verde County and a corresponding increase in demand on Amistad's recreational and educational resources. Implementing alternative B would add a long-term minor beneficial component to the cumulative long-term moderate beneficial effect on the visitor experience.

Conclusion

Implementing alternative B would result in long-term moderate to major beneficial effects on visitor understanding and the visitor experience. The actions of this alternative would not impair the national recreation area's resources.

SOCIOECONOMIC ENVIRONMENT

Recreational use of the reservoir directly and indirectly has a measurable influence on the economy of Del Rio and Val Verde County. The national recreation area is the major travel and tourist attraction in the region, drawing an average of more than 1 million visitors a year. It is assumed that this level of visitation will rise proportionally in the future with an increase in regional populations.

Visitor spending in the local economy totaled \$23.5 million in 2002. NPS operations contribute an additional \$3.5 million to the local economy. NPS operations and visitor-related services combine to add more than 500 jobs to the economies of Del Rio and Val Verde County. Other economic effects related to Amistad result from the construction of second or weekend homes, cooperative programs with Seminole Canyon State Park and Historic Site, and NPS-sponsored educational and interpretive programs.

Because the actions of alternative B would continue the existing trends or increase them, the current "baseline" socioeconomic effects and benefits to the local and regional economy would continue or slightly increase. There would be some change in direct NPS employment in the ranger division and the maintenance and interpretive divisions. The growth of related private sector employment serving visitors or other service sectors would increase, including concession services. This alternative would include funds for building a new visitor facility and rehabilitating NPS facilities to maintain the current programs and levels of service. There would be both direct and indirect long-term minor beneficial effects from continuing the existing practices.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad established the recreational opportunities and

corresponding effects of the national recreation area on the local economy. Continued residential development adjacent to and stimulated by the presence of the reservoir would contribute to the economy of Del Rio and the county. The actions of alternative B would add a long-term minor beneficial component to the cumulative long-term moderate beneficial effects on the regional economy.

Conclusion

The benefits that the national recreation area brings to the local and regional economy would continue or increase. Direct and indirect long-term minor to moderate beneficial effects on the local and regional economy would result from NPS management and operations, and from visitor use and experience of the national recreation area.

VISITOR ACCESS AND TRANSPORTATION

Analysis

The preferred alternative would result in long-term minor beneficial effects on transportation and visitor access to the national recreation area. The demand for the national recreation area's resources would grow because of increased visitation. Improved roads, boat launch sites, and other transportation would enhance visitors' ability to use and enjoy the national recreation area. Greater reliance on concession services would enhance the ability of people who do not own boats to use the reservoir. Concession services would also expand opportunities for access to the lake for nonmotorized boating such as sailing boats, kayaks, and canoes. Improvements to the trails system, campgrounds, and highway signs also would improve transportation and visitor access. Implementation of the recommendations of the transportation planning

study would also facilitate circulation with the national recreation area.

Cumulative Effects

The construction of Amistad Dam and the subsequent creation of Lake Amistad established the recreational opportunities that attract both local and regional visitors. Continued population growth in the city of Del Rio and Val Verde County will place additional demands on these resources. The actions of alternative B would add a minor component to cumulative long-term moderate beneficial effects on transportation and visitor access in the national recreation area.

Conclusion

Alternative B would result in a long-term minor beneficial effect on transportation and visitor access in the national recreation area.

NPS OPERATIONS, FACILITIES, AND CONCESSIONS

NPS operations would be improved under the preferred alternative. New facilities for visitors, administration, and maintenance would be constructed. The development of a new law enforcement facility and the new ranger station at Box Canyon would improve operations relating to border security and visitor safety. The actions of alternative B would result in long-term moderate to major beneficial effects on NPS operations and facilities.

Concession activities would be increased under alternative B, providing more services for visitors. Some operations of the expanded concessions would be relocated to the Box Canyon facility, resulting in long-term moderate beneficial effects on concession operations.

Cumulative Effects. There would be no cumulative effects on NPS operations or concessions from alternative B.

Conclusion. Alternative B would result in long-term moderate to major beneficial effects on NPS operations.

Alternative B would cause long-term moderate beneficial effects on concession operations.

UNAVOIDABLE ADVERSE IMPACTS

No unavoidable adverse impacts would result from implementing the preferred alternative.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible or irretrievable commitments of resources would result from implementing alternative B.

RELATIONSHIPS OF SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Expanding recreational visitor activities would not reduce the long-term productivity of the natural and cultural environments of

Amistad National Recreation Area. *Productivity* in this context refers to maintaining the resource values that led to the creation of Amistad as a unit of the national park system. Ongoing visitor and administrative use of the national recreation area for such human activities as fishing, boating, hunting, hiking, seeing wildlife, and enjoying archeological resources would not cause unacceptable adverse impacts on wildlife, habitat, water quality, threatened and endangered species, or cultural resources. The proposed developments of alternative B would affect the long-term productivity of these resources. Increased recreational use, visitor activities, and planned facility improvements under alternative B would improve the long-term productivity of the socioeconomic environment over the short term and the long term.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Alternative B would require less energy than alternative A because the new visitor and administrative facilities would be more energy-efficient than the existing facilities.

Consultation and Coordination



PUBLIC AND AGENCY INVOLVEMENT

This *Draft General Management Plan / Environmental Assessment* for Amistad National Recreation Area represents the thoughts and ideas of the National Park Service, the national recreation area staff, visitors, and the public. Consultation and coordination among the agencies and the public were vitally important throughout the planning process. There were three primary avenues by which the public participated during the development of the plan — participation in public meetings, responses to newsletters, and comments on the national recreation areas Web site.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and newsletters were used to keep the public informed and involved in the planning process for Amistad National Recreation Area. A mailing list was compiled that consisted of members of government agencies, organizations, businesses, legislators, local governments, and interested citizens.

A notice of intent to prepare an environmental impact statement was published in the *Federal Register* on January 16, 2003. The National Park Service determined in 2006 that an environmental assessment was the appropriate NEPA compliance document for the *General Management Plan*. A notice of termination of the environmental impact statement was published in the *Federal Register* on April 20, 2006.

The first newsletter, issued in March 2003, described the planning effort. Public meetings conducted in April 2003 in Midland, San Antonio, and Del Rio, Texas, were attended by a total of 50 people. The National Park Service also met with city, county, and state agencies in February, March, and April 2003. The

National Park Service continues to consult regularly with these agencies.

Comments were received at the meetings, and 70 electronic and mailed responses to the first newsletter were received. These comments were considered and incorporated into the issues for the plan.

A second newsletter distributed in July 2004 described the draft alternative concepts for managing the national recreation area. A total of 60 electronic and mailed comments were received in response to that newsletter.

Additional consultation with state and local officials and the general public has been undertaken during the preparation of the Transportation Planning Study and the socioeconomic study conducted in support of the general management plan.

Throughout the process, NPS staff and the planning team have consulted with federal and state elected representatives, federal and state agencies, including the National Park Service, U.S. Fish and Wildlife Service, the Texas State Parks and Wildlife Department, the Texas Historical Commission, the International Boundary and Water Commission (IBWC), and the office of the mayor, Del Rio, Texas.

CONSULTATION WITH OTHER AGENCIES, OFFICIALS, AND ORGANIZATIONS (TO DATE)

Section 7 Consultation (Endangered Species Act)

To comply with section 7 of the Endangered Species Act, the National Park Service coordinated informally with the U.S. Fish and Wildlife Service, U.S. Department of the Interior.

During the preparation of this document, NPS staff has coordinated informally with the U.S. Fish and Wildlife Service. The list of threatened and endangered species (see appendix B) was compiled with the use of lists and information received from the U.S. Fish and Wildlife Service.

In accordance with the Endangered Species Act and relevant regulations at 50 CFR 402, the National Park Service determined that this *General Management Plan* would not be likely to cause adverse effects on any federally listed threatened or endangered species. The National Park Service sent a copy of this draft plan to the U.S. Fish and Wildlife Service with a request for written concurrence with that determination.

In addition, the National Park Service has committed to consult about future actions conducted under the framework described in this plan to ensure that such actions will not be likely to adversely affect threatened or endangered species.

Native American Consultation

As part of the general management planning process, NPS staff sent letters to different Native American groups inviting them to participate in the process. The specific tribes who received the letters had been previously identified as being potentially affiliated in the “Ethnographic Overview.” No tribes requested participation in the development of the general management plan.

Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.) to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the Texas historic preservation office and the Advisory Council on Historic Preservation inviting their participation in the planning process (see appendix C). Copies of all the newsletters were sent to both offices with a request for comments.

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
U.S. Department of Defense
 U.S. Air Force
U.S. Department of Homeland Security
U.S. Department of the Interior
 Bureau of Reclamation
 National Park Service
 U.S. Fish and Wildlife Service
 U.S. Geological Survey
U.S. Environmental Protection Agency

U.S. SENATORS AND REPRESENTATIVES

Honorable John Cornyn, U.S. Senate
Honorable Kay Hutchinson, U.S. Senate
Honorable Henry Bonilla, U.S. House of Representatives

STATE AGENCIES

Texas Commission on Environmental Quality
Texas Department of Parks and Wildlife
Texas Department of Public Safety
Texas Historical Commission (State Historic Preservation Office)
University of Texas, Austin

STATE OFFICIALS

Governor Rick Perry
State Representative Pete P. Gallego
State Senator Frank L. Madla

LOCAL AND REGIONAL GOVERNMENT AGENCIES

Val Verde County Commissioners
City of Del Rio, Office of the Mayor
San Felipe Del Rio Consolidated Independent School District
Seminole Canyon State Park and Historic Site
The Shumla School
Val Verde County Library

ORGANIZATIONS AND BUSINESSES

Audubon Society of Texas
Bluewater Network
Del Rio Chamber of Commerce
Del Rio County Library
Del Rio News-Herald
KDLK Radio
National Park Concessions, Inc.
National Parks and Conservation Association
National Park Foundation
The Nature Conservancy
The Rock Art Foundation

INDIVIDUALS

Available from Amistad National Recreation Area headquarters



APPENDIX A: LEGISLATION

NATIONAL RECREATION AREAS

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XIII. NATIONAL RECREATION AREAS

1. Amistad

PUBLIC LAW 101-628—NOV. 28, 1990

104 STAT. 4469

Public Law 101-628
101st Congress

An Act

To provide for the designation of certain public lands as wilderness in the State of Arizona.

Nov. 28, 1990
[H.R. 2570]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

* * * * *

TITLE V—NATIONAL PARK SYSTEM UNITS IN TEXAS

104 STAT. 4492
Natural
resources.

* * * * *

SEC. 505. ESTABLISHMENT OF AMISTAD NATIONAL RECREATION AREA.

104 STAT. 4494
Mexico.
16 USC 460fff.

(a) In order to—

(1) provide for public outdoor recreation use and enjoyment of the lands and waters associated with the United States portion of the reservoir known as Lake Amistad, located on the boundary between the State of Texas and Mexico, and

(2) protect the scenic, scientific, cultural, and other value contributing to the public enjoyment of such lands and waters.

there is hereby established the Amistad National Recreation Area (hereafter in this section and section 506 referred to as the "recreation area").

(b) The recreation area shall consist of the Federal lands, waters, and interests therein within the area generally depicted on the map entitled "Boundary Map, Proposed Amistad National Recreation Area", numbered 621/20,013-B, and dated July 1969. The map shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior. The Secretary of the Interior (hereafter in this Act referred to as the "Secretary") may from time to time make minor revisions in the boundary of the recreation area, but the total acreage of the recreation area may not exceed 58,500 acres. Within the boundary of the recreation area, the Secretary may acquire lands and interests in lands by purchase with donated or appropriated funds, exchange, or transfer without reimbursement from any Federal agency.

SEC. 506. ADMINISTRATION.

16 USC 460fff-1.

(a) The Secretary shall administer the recreation area in accordance with applicable provisions of this Act and the provisions of law generally applicable to units of the national park system, including the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat.

104 STAT. 4494

PUBLIC LAW 101-628—NOV. 28, 1990

535; 16 U.S.C. 1, 2-4), and the Act of August 7, 1946 (60 Stat. 885). In the administration of such recreation area, the Secretary may utilize such statutory authority as may be available to him for the protection of natural and cultural resources as he deems necessary to carry out the purposes of this Act. Nothing in this Act shall be construed to amend or alter the responsibilities of the International Boundary and Water Commission, United States and Mexico, under any applicable treaty.

104 STAT. 4495

(b) The administration of the recreation area by the Secretary shall be subject to and in accordance with all applicable treaties, including the treaty between the United States and Mexico relating to the utilization of waters of the Colorado and Tijuana Rivers and the Rio Grande, entered into force November 8, 1945 (59 Stat. 1219, and in accordance with the Act of July 7, 1960 (Public Law 86-605; 74 Stat. 360), and any commitment or agreement entered into pursuant to such treaty or Act, including (but not limited to) commitments or agreements relating to—

- (1) the demarcation and maintenance of boundaries;
- (2) the use, storage, and furnishing of water;
- (3) control of floods;
- (4) investigations relative to the operation of the Amistad Dam; and
- (5) the production of hydroelectric energy.

Reports.

(c) The Secretary shall conduct a survey of the cultural resources in the immediate vicinity of the recreation area. The Secretary is authorized to enter into cooperative agreements with public or private entities, including landowners, for the purpose of conducting the survey required by this subsection. Not later than two years after the date of enactment of this Act, the Secretary shall submit a report to the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the Senate on the results of the survey required by this subsection.

(d)(1) The Secretary shall permit hunting and fishing on lands and waters under the Secretary's jurisdiction within the recreation area in accordance with applicable Federal and State law. The Secretary may designate zones where, and establish periods when, hunting or fishing will not be permitted for reasons of public safety, administration, fish and wildlife management, or public use and enjoyment.

(2) Except in emergencies any regulations issued by the Secretary under this subsection shall be put into effect only after consultation with the appropriate State agencies responsible for hunting and fishing activities.

(e) For purposes of administering the recreation area, the Secretary may enter into cooperative agreements with any Federal agency, the State of Texas, or any political subdivision thereof, for the rendering, on a reimbursable basis, of rescue, firefighting, and law enforcement and fire preventive assistance.

16 USC 460fff-2.

SEC. 507. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated such sums as may be necessary to carry out the purposes of sections 505 and 506 of this Act.

* * * * *

**APPENDIX B: LETTERS FROM THE U.S. FISH AND WILDLIFE SERVICE
AND TEXAS PARKS AND WILDLIFE**



United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
(512) 490-0057

November 5, 2002

Mary Magee (DSC-PSD)
National Park Service, Denver Service Center
12795 W. Alameda Parkway
P.O. Box 25287
Denver, Colorado 80225-0287

Cons.# 2-15-03-I-0037

Dear Ms. Magee:

Thank you for your October 10, 2002, inquiry requesting a current list of Federal candidate, proposed, or listed threatened and endangered species and any other special status species that might occur in Amistad National Recreation Area, Val Verde County, Texas. We understand the National Park Service is initiating a general management plan/environmental impact statement to prescribe resource conditions and visitor experiences to be achieved and maintained at the recreation area.

Threatened and Endangered Species

We have reviewed the information you provided for potential effects to species federally listed as threatened or endangered or proposed for listing as well as effects to designated or proposed critical habitat for these species. Amistad National Recreation Area is not located within the designated critical habitat of any federally listed species. In addition, the following federally listed threatened (T) or endangered (E) or proposed (P) species have been documented or may occur as migrants in Val Verde County:

<u>Common Name</u>	<u>Status</u>	<u>Scientific Name</u>
Black-capped vireo	E	Vireo atricapillus
Brown pelican	E	Pelecanus occidentalis
Least tern	E	Sterna antillarum
Texas snowbells	E	Styrax texana
Tobusch fishhook cactus	E	Ancistrocactus (=Echinocactus=Mammillaria) tobuschii
Devils River minnow	T	Dionda diaboli
Bald eagle	T	Haliaeetus leucocephalus
Mountain plover	P/T	Charadrius montanus

Mary Magee

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We recommend a qualified individual survey any areas potentially affected by your proposed activities to determine whether they may be occurring in habitats suitable for these species. If surveys determine that suitable habitat exists or the species are present and may be affected, we recommend you contact our office prior to engaging in any activities that may directly or indirectly affect the above listed species.

Candidates for Listing

We also recommend that you review the potential for your project to affect the following species that are candidates (C) for addition to the threatened and endangered species list.

<u>Common Name</u>	<u>Status</u>	<u>Scientific Name</u>
Texas hornshell (clam)	C	<i>Popenaias popei</i>

Candidate species are species that are being considered for possible addition to the threatened and endangered species list. There is sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but higher priority listings currently preclude issuance of a proposed rule for those species.

Candidate Species currently have no legal protection. If you find you have potential project impacts to these species the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.

The State of Texas provides legal protection for additional species of plants and animals (Texas Parks and Wildlife Code Chapters 67, 68, and 88). We recommend you contact the Diversity Program of the Texas Parks and Wildlife Department, 3000 IH-35 South, Suite 100, Austin, Texas 78704 (512-912-7011) for information concerning animals and plants of State concern.

If after reviewing the enclosed information, you need additional advice, guidance, or information, please contact us again. If you determine your project may impact resources that are of concern to the Service, or that have legal protection and require Service permits or consultation, please contact Jenny Wilson of this office at 512/490-0057, extension 231 or the above address.

Sincerely,



for William M. Seawell
Acting Field Supervisor



December 2, 2002

COMMISSIONERS
 KATHARINE ARMSTRONG
 CHAIRMAN, AUSTIN
 ERNEST ANGELO, JR.
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 SAN ANTONIO
 LEE M. BASS
 CHAIRMAN-EMERITUS
 FORT WORTH
 ROBERT L. COOK
 EXECUTIVE DIRECTOR

Ms. Mary Magee
 US Department of the Interior
 National Park Service
 Denver Service Center
 12795 W. Alameda Parkway
 P.O. Box 25287
 Denver, CO 80225-0287

Dear Ms. Magee:

This letter is in response to your information request, dated October 10, 2002, for rare and threatened and endangered (T&E) species in the immediate vicinity of Amistad National Recreation Area (NRA) in Val Verde County. This response does not constitute a review of potential impacts to rare and T&E species from proposed project activities.

Given the small proportion of public versus private land in Texas, the TPWD Biological and Conservation Data System (BCD) does not include a representative inventory of rare resources in many areas of the state. Although it is based on the best data available to TPWD regarding rare species, the data from the BCD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in your project area. These data cannot substitute for an on-site evaluation by your qualified biologists. The BCD information is intended to assist you in avoiding harm to species that may occur on your site.

Currently, the below BCD occurrences are documented at Amistad NRA. BCD printouts are enclosed for these occurrences. **Please do not include the occurrence printouts in your draft or final documents. Because some species are especially sensitive to collection or harassment, these records are for your reference only:**



Take a kid
 hunting or fishing
 • • •
 Visit a state park
 or historic site

Federal and State Listed Endangered
 Interior Least Tern (*Sterna antillarum athalassos*)

State Listed Threatened
 Texas Tortoise (*Gopherus berlandieri*)

Species of Concern
 Cave Bat (*Myotis velifer*)
 Pale Townsend's Big-eared Bat (*Corynorhinus townsendii pallescens*)
 Hairy-legged Vampire (*Diphylla ecaudata*)

4200 SMITH SCHOOL ROAD
 AUSTIN, TEXAS 78744-3291
 512-389-4800
 www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.
 valy info only amistad nra.doc

Ms. Mary Magee, National Park Service
Information Only/Amistad National Recreation Area
Page 2

Species of Concern (continued)

Yuma Myotis Bat (*Myotis yumanensis*)
Amistad Gambusia (*Gambusia amistadensis*)
Snowy Plover (*Charadrius alexandrinus*)
Mexican Hooded Oriole (*Icterus cucullatus cucullatus*)

Special Feature

Colonial Waterbird Rookery

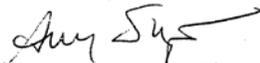
TPWD does not designate critical habitat for state-listed species or species of concern. For information on critical habitat of federally listed species potentially occurring on or near the project site, please contact the US Fish and Wildlife Service Austin Ecological Services office at (512) 490-0057.

Enclosed is a copy of the TPWD county list of rare and T&E species for Val Verde County. TPWD recommends the county list be reviewed entirely as species could be present depending upon habitat availability. If rare or T&E plant or animal species are found within or near the project area, TPWD recommends precautions be taken to avoid adverse impacts to them.

This letter does not constitute a general review of fish and wildlife impacts that might result from the activity for which this information is provided. Should you need such a review, contact Kathy Boydston, TPWD Wildlife Habitat Assessment Program, Wildlife Division (512) 389-4571.

Thank you for the opportunity to provide information for this project. Please contact me if you have any questions or need additional assistance (512) 912-7054.

Sincerely,



Amy Sugeno, Habitat Review Assistant
Wildlife Habitat Assessment Program, Wildlife Division
Threatened and Endangered Species

Enclosures (2)



**The Texas Biological
and Conservation Data System**



The Texas Biological and Conservation Data System (TXBCD), established in 1983, is the Department's most comprehensive source of information on rare, threatened, and endangered plants and animals, exemplary natural communities, and other significant features. Though it is not all-inclusive, the TXBCD is constantly updated, providing current or additional information on statewide status and locations of these unique elements of natural diversity.

The TXBCD gathers biological information from museum and herbarium collection records, publications, experts in the scientific community, organizations, individuals, and on-site field surveys conducted by TPWD staff on public lands or private lands with written permission. TPWD staff botanists, zoologists, and ecologists perform field surveys to locate and verify specific occurrences of high-priority biological elements and collect accurate information on their condition, quality, and management needs.

The TXBCD can be used to help evaluate the environmental impacts of routing and siting options for development projects. It also assists in impact assessment, environmental review, and permit review.

Given the small proportion of public versus private land in Texas, the TXBCD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, these data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. The TXBCD information is intended to assist the user in avoiding harm to species that may occur.

Please use the following citation to credit the TXBCD as the source for this county level information:

Texas Biological and Conservation Data System. Texas Parks and Wildlife, Wildlife Diversity Branch. County Lists of Texas' Special Species. [county name(s) and revised date(s)].

For information on obtaining a project review form or a site-specific review of a project area for rare species, and for updated county lists, please call (512) 912-7011.

Last Revised Date: 10/21/02



Notes for
County Lists of
Texas' Special Species



The Texas Parks and Wildlife (TPWD) county lists **include**:

Vertebrates, Invertebrates, and Vascular Plants on the special species lists of the Texas Biological and Conservation Data System. These special species lists are comprised of all species, subspecies, and varieties that are federally listed; proposed to be federally listed; have federal candidate status; are state listed; or carry a global conservation status indicating a species is imperiled, very rare, or vulnerable to extirpation.

Colonial Waterbird Nesting Areas and Migratory Songbird Fallout Areas are contained on the county lists for coastal counties only.

The TPWD county lists **exclude**:

Natural Plant Communities such as Little Bluestem-Indiangrass Series (native prairie remnant), Water Oak-Willow Oak Series (bottomland hardwood community), Saltgrass-Cordgrass Series (salt or brackish marsh), Sphagnum-Beakrush Series (seepage bog).

Other Significant Features such as non-coastal bird rookeries, migratory bird information, bat roosts, bat caves, invertebrate caves, and prairie dog towns.

The **revised date** on each county list reflects the last date any changes or revisions were made for that county and reflects current listing statuses and taxonomy.

Species that appear on county lists do not all share the same probability of occurrence within a county. Some species are migrants or wintering residents only. Additionally, a few species may be historic or considered extirpated within a county. Species considered extirpated within the state are so flagged on each list.

This information is for your assistance only; due to continuing data updates, **please do not reprint or redistribute the information, instead refer all requesters to our office to obtain the most current information available.**

Last Revised Date: 10/21/02

Texas Parks & Wildlife
Annotated County Lists of Rare Species

Last Revision: 6/28/02
Page 1 of 5

VAL VERDE COUNTY

Federal Status State Status

***** DRAFT ***** DRAFT ***** DRAFT***** DRAFT ***** DRAFT ***** DRAFT*****
UNDER CONSTRUCTION **** SPECIES MIGHT BE ADDED/DELETED DURING QUALITY CONTROL
***AMPHIBIANS ***

Edwards Plateau Spring Salamanders (*Eurycea* sp. 7) - endemic; springs and waters of some caves of this region

*** BIRDS ***

- | | | |
|--|----|---|
| American Peregrine Falcon (<i>Falco peregrinus anatum</i>) - potential migrant; nests in west Texas | DL | E |
| Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>) - potential migrant | DL | T |
| Audubon's Oriole (<i>Icterus graduacauda audubonii</i>) - scrub, mesquite; nests in dense trees, or thickets, usually along water courses | | |
| Black-capped Vireo (<i>Vireo atricapillus</i>) - oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer | LE | E |
| Interior Least Tern (<i>Sterna antillarum athalassos</i>) - nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures | LE | E |
| Mexican Hooded Oriole (<i>Icterus cucullatus cucullatus</i>) - scrub, mesquite; nests in dense trees, or thickets, usually along water courses | | |
| Snowy Plover (<i>Charadrius alexandrinus</i>) - wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats | | |
| Wood Stork (<i>Mycteria americana</i>) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960 | | T |
| Zone-tailed Hawk (<i>Buteo albonotatus</i>) - arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions | | T |

*** FISHES ***

- | | | |
|---|--|---|
| Blotched Gambusia (<i>Gambusia senilis</i>) (extirpated) - formerly known from springs and vegetated, quiet pools of the Devils River; extant in Rio Conchos drainage, Mexico | | T |
| Blue Sucker (<i>Cypleptus elongatus</i>) - usually inhabits channels and flowing pools with a moderate current; bottom type usually consists of exposed bedrock, perhaps in combination with hard clay, sand, and gravel; adults winter in deep pools and move upstream in spring to spawn on riffles | | T |

	Federal Status	State Status
Bluntnose Shiner (<i>Notropis simus</i>) (extirpated) - main river channels, often below obstructions over substrate of sand, gravel, and silt; damming and irrigation practices presumed major factors contributing to decline		
Conchos Pupfish (<i>Cyprinodon eximius</i>) - sloughs, backwaters, and margins of larger streams, channels of creeks, and mouths		T
Devils River Minnow (<i>Dionda diaboli</i>) - rocky runs and flowing pools of Devils River and nearby San Felipe, Sycamore, and Las Moras creeks	LT	T
Headwater Catfish (<i>Ictalurus lupus</i>) - springs, and sandy and rocky riffles, runs, and pools of clear creeks and small rivers; in Texas, limited to Rio Grande drainage, including the Pecos River system		
Mexican Stoneroller (<i>Campostoma ornatum</i>) - in Texas, Big Bend region; clear, fast riffles, chutes, and pools in small to medium-sized creeks with gravel or sand bottoms		T
Pecos Pupfish (<i>Cyprinodon pecosensis</i>) - springs, sinkholes, and pools of streams in the Pecos River drainage; vulnerable to hybridization with introduced population of Sheepshead Minnow (<i>C. variegatus</i>)		T
Proserpine Shiner (<i>Cyprinella proserpina</i>) - rocky runs and pools of creeks and small rivers		T
Rio Grande Darter (<i>Etheostoma grahami</i>) - gravel and rubble riffles of creeks and small rivers		T
Rio Grande Shiner (<i>Notropis jemezanus</i>) - large, open, weedless rivers or large creeks with bottom of rubble, gravel and sand, often overlain with silt		
Southwestern Gambusia (<i>Gambusia speciosa</i>) -		

*** INSECTS ***

Flint's Net-spinning Caddisfly (*Cheumatopsyche flinti*) - very poorly known species with habitat description limited to "a spring"

*** MAMMALS ***

Big Free-tailed Bat (<i>Nyctinomops macrotis</i>) - habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, but gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore		
Black Bear (<i>Ursus americanus</i>) - formerly widespread throughout the state, now restricted to remnant populations in mountainous areas of the Trans-Pecos region; breeding season June-July, with one to four (usually two) young born in January-February; inactive for period during winter (not true hibernation); opportunistic diet		T
Black-tailed Prairie Dog (<i>Cynomys ludovicianus</i>) - mostly short-grass prairie, but also "hard pan" flats; strictly diurnal; live in underground burrows in colonies ("towns") which vary in size from several to thousands of individuals; formerly ranged across western half of state		C1
Cave Myotis Bat (<i>Myotis velifer</i>) - colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (<i>Hirundo pyrrhonota</i>) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore		

Texas Parks & Wildlife
 Annotated County Lists of Rare Species
 VAL VERDE COUNTY, cont'd

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	Federal Status	State Status
Ghost-faced Bat (<i>Moormops megalophylla</i>) – colonial, cave-dwelling bat; roosts in caves, crevices, abandoned mines, and buildings; insectivorous; breeding late winter-early spring; single offspring born per year		
Gray Wolf (<i>Canis lupus</i>) (extirpated) – formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	LE	E
Greater Western Mastiff Bat (<i>Eumops perotis californicus</i>) – diurnal roosts in rock crevices of vertical cliffs; colony size varies from several individuals to several dozen; males and females may remain together throughout the year; single offspring (occasionally twins) born June-July		
Pale Townsend's Big-eared Bat (<i>Corynorhynchus townsendii pallescens</i>) – roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore		
Texas Pocket Gopher (<i>Geomys personatus fuscus</i>) - underground burrows of deep, sandy soils; feed mostly on vegetation; reproductive data not well known, but likely breed year round, with no more than two litters per year		
Yuma Myotis Bat (<i>Myotis yumanensis</i>) - desert regions; most commonly found in lowland habitats near open water, where forages; roosts in caves, abandoned mine tunnels, and buildings; season of parts is May to early July; usually only one young born to each female		

*** MOLLUSKS ***

Salina Mucket (<i>Disconaias salinasensis</i>) – Rio Grande, from Big Bend to Del Rio, south into Mexico		
Texas Hornshell (<i>Popenaias popei</i>) - Rio Grande drainage from the Pecos River to the Falcon Breaks	C1	

*** REPTILES ***

Big Bend Blackhead Snake (<i>Tantilla cucullata</i>) – small size with a uniform body color and a small, dark head; secretive; fossorial; mostly nocturnal; mesquite-creosote and pinon-juniper-oak; eggs laid June-August; eat insects, spiders, and other invertebrates		T
Big Bend Slider (<i>Trachemys gaigeae</i>) – almost exclusively aquatic, sliders (<i>Trachemys</i> spp.) prefer quiet bodies of fresh water with muddy bottoms and abundant aquatic vegetation, which is their main food source; will bask on logs, rocks or banks of water bodies; breeding March-July; this species found in Big Bend region of Texas and northeastern Mexico		
Indigo Snake (<i>Drymarchon corais</i>) - thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter		T
Mexican Blackhead Snake (<i>Tantilla atriceps</i>) - southern Texas and northeastern Mexico; shrubland savanna; nocturnal; lays clutch of probably 1-3 eggs		
Reticulate Collared Lizard (<i>Crotaphytus reticulatus</i>) - requires open brush-grasslands; thorn-scrub vegetation, usually on well-drained rolling terrain of shallow gravel, caliche, or sandy soils; often on scattered flat rocks below escarpments or isolated rock outcrops among scattered clumps of prickly pear and mesquite		T

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VAL VERDE COUNTY, cont'd

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	Federal Status	State Status
Spot-tailed Earless Lizard (<i>Holbrookia lacerata</i>) - central & southern Texas and Adjacent Mexico; oak-juniper woodlands & mesquite-prickly pear associations; eggs laid underground; eats small invertebrates		
Texas Horned Lizard (<i>Phrynosoma cornutum</i>) - open, arid and semi-arid regions with sparse vegetation, which could include grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Texas Tortoise (<i>Gopherus berlandieri</i>) - open scrub woods, arid brush, lomas, grass-cactus association; open brush with grass understory preferred; uses shallow depressions at base of bush or cactus or underground burrow or hides under surface cover		T

*** VASCULAR PLANTS ***

Cliff bedstraw (<i>Galium correllii</i>) - dry, steep, or vertical limestone cliff faces of various exposures in Chihuahuan Desert along Rio Grande; flowering April-November; fruiting May-December		
Correll's false dragon-head (<i>Physostegia correllii</i>) - wet soils including roadside ditches and irrigation channels; flowering June-July		
Dwarf broomspurge (<i>Chamaesyce jejuna</i>) - endemic; according to specimen collections, found on caliche uplands and slopes, and limestone hills; flowering spring-summer (?)		
Longstalk heimia (<i>Nesaea longipes</i>) - moist or subirrigated alkaline or gypsiferous clayey soils along unshaded margins of cienegas and other desert wetlands; flowering May-September		
Perennial caltrop (<i>Kallstroemia perennans</i>) - barren gypseous clays or limestone soils at low elevations in the Chihuahuan Desert; flowering late spring-early fall		
Rydberg's scurfpea (<i>Pediomelum humile</i>) - shortgrass grasslands on shallow stony soils on dry open limestone hills; flowering April-May		
Sabinal prairie-clover (<i>Dalea sabinalis</i>) - information sketchy, but probably in rocky soils or on limestone outcrops in sparse grassland openings in juniper-oak woodlands		
Sonora fleabane (<i>Erigeron mimegletes</i>) - endemic; shallow clay soils over limestone; flowering April-June (and again in fall?)		
Texas grease bush (<i>Forsellesia texensis</i>) - dry limestone ledges and chalk bluffs; flowering in fall?		
Texas snowbells (<i>Styrax platanifolius</i> ssp. <i>texanus</i>) - limestone bluffs, boulder slopes, and cliff faces, usually along perennial streams in canyon bottoms, in full sun or in partial shade of diverse evergreen-deciduous woodlands; flowering April-May	LE	E
Texas trumpets (<i>Acleisanthes crassifolia</i>) - shallow, well-drained, calcareous, gravelly loams over caliche on gentle to moderate slopes, often in sparsely vegetated openings in cenizo (<i>Leucophyllum frutescens</i>) shrublands		
Tobusch fishhook cactus (<i>Sclerocactus breviphamatus</i> var. <i>tobuschii</i>) - endemic; very shallow gravelly soil in shortgrass grasslands among live oak-juniper woodlands on limestone uplands; occasionally in gravels along creek bottoms; flowering (January-) February - March (-April)	LE	E
Warnock's rock-daisy (<i>Perityle warnockii</i>) - crevices in steep, dry, inaccessible limestone bluffs; flowering in fall (October?)		

Texas Parks & Wildlife
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VAL VERDE COUNTY, cont'd

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Federal	State
Status	Status

Wright's trumpets (*Acleisanthes wrightii*) - open semi-desert grasslands and shrublands on shallow stony soils over limestone on low hills and flats; flowering spring-fall, probably opportunistically

Wright's water-willow (*Justicia wrightii*) - shortgrass grasslands and/or shrublands, dry gravelly clay soils over limestone on flats and low hills; flowering April-July

LE,LT - Federally Listed Endangered/Threatened PE,PT - Federally Proposed Endangered/Threatened E/SA,T/SA - Federally Endangered/Threatened by Similarity of Appearance C1 - Federal Candidate, Category 1; information supports proposing to list as endangered/threatened DL,PDL - Federally Delisted/Proposed Delisted E,T - State Endangered/Threatened "blank" - Rare, but with no regulatory listing status

<i>Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.</i>
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APPENDIX C: LETTER FROM THE TEXAS HISTORICAL COMMISSION



TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

October 29, 2002

Alan W. Cox
Superintendent
Amistad National Recreation Area
HCR 3, Box 5J
Del Rio, Texas 78840-9350

Re: Project review under Section 106 of the National Historic Preservation Act of 1966,
General Management Plan/Environmental Impact Statement

Dear Superintendent Cox:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Debra L. Beene, appreciates the opportunity to participate as a member of the planning team and looks forward to the formal planning consultation. Reviewer and Trans Pecos Regional Archeologist, Debra Beene, wishes to participate in the planning process as a team member, as workload allows. The Texas Historical Commission supports the development of a General Management Plan for Amistad National Recreation Area, which preserves and protects some of the most important cultural resource sites in North America.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for this opportunity, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions or if we can be of further assistance, please contact Debra L. Beene at 512/463-5865.**

Sincerely,

A handwritten signature in cursive script, appearing to read "F. Lawrence Oaks".

for
F. Lawrence Oaks, State Historic Preservation Officer

cc: Joe Labadie, Amistad NRA
Craig Cellar, Denver Service Center

FLO/dlb

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PREPARERS AND CONSULTANTS

PREPARERS

NPS Denver Service Center

Tom Thomas, Project Manager, Overall project coordination, B.A., M.A. Ph.D. (History); 14 years with the National Park Service

Craig Cellar, Cultural Resource Specialist. B.A., (Archeology), 28 years with the National Park Service

Amistad National Recreation Area

Alan Cox, Superintendent, Overall management, 30 years with the National Park Service

Mark Morgan, Management Assistant, GMP coordinator

Eric Finklestein, Interpretive Specialist

Joe Labadie, Cultural Resource Program Manager

Bruce Malloy, Chief Ranger

Ben Ruston, Chief of Maintenance

Rick Slade, Chief of Education and Resource Management

PUBLICATION SERVICES

Lou Layman, Writer-Editor (former), NPS Denver Service Center

Linda Ray, Supervisory Visual Information Specialist, NPS Denver Service Center

Sandy Schuster, Writer-Editor (former), NPS Denver Service Center

Lori Yokomizo, Information Technology Specialist, NPS Denver Service Center

CONSULTANTS

Ordonez and Vogelsang, Transportation Consulting

Ron Dutton, Socioeconomist

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