I. U.S. Fish and Wildlife Service Environmental Action Statement

U.S. FISH AND WILDLIFE SERVICE
ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of implementing the Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan is found not to have significant impacts as determined by the *Finding of No Significant Impact* (following) and the *Draft Comprehensive Conservation Plan and Environmental Assessment.*

Dr. Benjamin N. Tuggle
Regional Director
Region 2, U.S. Fish and Wildlife Service

Date 9/9/10

Manuel Perez III
Refuge Manager
Laguna Atascosa NWR

Date 9/9/10

Chris Pease
Regional Chief, NWR System, Region 2

Date 9-9-10

Carol Torrez
NEPA Coordinator, Region 2

Date 9/9/10

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT OF THE LAGUNA ATASCOSA NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (Service) has developed a Comprehensive Conservation Plan (Plan) and Environmental Assessment (EA) for the Laguna Atascosa National Wildlife Refuge (NWR) located in Cameron and Willacy Counties, Texas. The Plan provides management direction to present and future Refuge managers for the next 15 years. It will achieve the Refuge's vision for the future and the purposes for which the Refuge was originally established. The Plan describes management activities that occur on the Refuge and provides management goals, measurable objectives, and specific management strategies designed to protect and restore wildlife habitats, conserve "trust resources" such as migratory birds and threatened and endangered species, enhance compatible wildlife-dependent recreation opportunities, and related facilities.

An Environmental Assessment (EA) was completed to fulfill the requirements of the National Environmental Policy Act (NEPA) of 1969 and to inform the public of the possible environmental consequences of implementing the Plan. A total of three alternatives were evaluated and analyzed for potential impacts on the human environment. The EA was prepared to provide a decision-making framework that 1) explores a reasonable range of alternatives to meet project objectives, 2) evaluates potential issues and impacts to the Refuge, resources and values, and 3) identifies mitigation measures to minimize the degree or extent of these impacts.

ALTERNATIVES CONSIDERED AND ANALYZED

Alternative A: Current Management (No Action Alternative)

This alternative represents the status quo or no change from current management of the Refuge. Existing or traditional Refuge management practices would continue as they have in the past, including habitat management (prescribed burning, chemical and mechanical invasive species control), water management, biological inventory, facility and equipment maintenance, staffing, law enforcement, public uses (e.g., hunting, fishing, wildlife observation, environmental educational, hiking, etc.), and research. The Refuge would continue its emphasis on wintering and migratory bird habitat and Federal trust species, and on maintaining public uses of existing facilities and education programs at current levels. Current base funding and staffing levels would allow the Refuge to focus on limited habitat management and maintenance projects.

Alternative B: Proposed Action

Alternative B, which is the Service's proposed action, would adopt and implement the actions making up the Refuge's Plan. This includes an emphasis on all Federal trust species (e.g., migratory birds and federally-listed species) and priority species and their habitats within the Refuge, and invasive species control. This alternative also would improve and expand compatible public uses, improve and add new facilities, and enhance educational and outreach programs. The objectives and strategies detailed in the Plan would provide for short- and long-term conservation and enhancement of resources and values on the Refuge, above that of the current management scenario. With State and public input, the actions proposed within this alternative reflect a need to continue and enhance the major goals of resource

management and protection, as well as to focus on connecting people with nature through improving the Refuge's environmental education and interpretation programs, and fostering dynamic partnerships.

Alternative C

This alternative incorporates and emphasizes the public use activities identified by the public during scoping. In this alternative, the Refuge will concentrate efforts and resources on public uses to the maximum extent practicable when appropriate and compatible with the purposes of the Refuge. Under this alternative, wildlife, habitat, or biological diversity activities would essentially be allowed to remain as is. Current base funding and staffing levels would increase by up to four positions more than the existing staffing level. The Refuge would specifically maximize recreational opportunities and conveniences to visitors. Traditional programs such as hunting and fishing would be expanded as much and as often as possible to accommodate these popular activities.

DECISION: THE SELECTED ALTERNATIVE

Alternative B was selected as the Service's proposed action and is the basis for the Comprehensive Conservation Plan. This alternative describes how habitat objectives will be accomplished through a combination of management activities to encourage ecological integrity, promote restoration of coastal prairie habitats, control invasive plant species, and provide/enhance brush land, wetland and grassland habitat for ocelots, grassland and other migratory birds, migratory waterfowl, and other resident wildlife. This alternative was selected because it best meets refuge purposes and goals of the Laguna Atascosa National Wildlife Refuge. This action will not adversely impact endangered or threatened species or their habitat. Opportunities for wildlife-dependent recreation activities, such as hunting, fishing, observation, photography, environmental education, and interpretation will be enhanced. Future management actions will have a neutral or positive impact on the local economy and the recommendations in the Plan will ensure that Refuge management is consistent with the mission of the National Wildlife Refuge System.

SUMMARY EFFECTS OF EACH ALTERNATIVE

Implementation of the Service's decision would be expected to result in environmental, social and economic effects as described in the Comprehensive Conservation Plan/EA and summarized here. The Plan describes habitat management, wildlife management, and public use objectives that would result in increased migratory bird utilization and production; increased protection of threatened and endangered species; enhanced wildlife populations; and improved habitat conditions. The proposed visitor service management activities would result in enhanced prospects for wildlife-dependent recreational opportunities.

Refuge management activities (habitat preservation and restoration, infrastructure improvements, water management) would result in short-term minor negative impacts to soils, air, water, habitat and wildlife as described in the EA; however, the long-term impacts are expected to be beneficial. These management activities would result in the creation and improvement of habitat to provide components such as native grassland protection, brush land restoration, and artificial water source protection. The Refuge would also take a proactive approach to working with information provided through biological surveys, inventories, and monitoring to determine changing conditions and vegetative and associated wildlife needs.

Opportunities for wildlife-dependent activities such as wildlife observation, photography, environmental education, interpretation, fishing and hunting would be enhanced. Disturbance to wildlife at some level is an unavoidable consequence of any public use program, regardless of the activity involved. Obviously, some activities innately have the potential to cause greater disturbance than others. As currently proposed, the known and anticipated levels of disturbance associated with management actions are considered

minimal and well within the tolerance levels of known wildlife species and populations present in the area. Implementation of activities provided by the visitor services program would take place through carefully controlling timing and placement to avoid direct contact with sensitive areas, such as nesting habitat, or wildlife. Hunting activities would be enhanced, including the use of bilingual public hunting information and developing a revised hunting plan, and would be conducted within the constraints of sound biological principles for the management. Monitoring activities through wildlife inventories and assessments of public use levels and activities would be utilized and visitor use programs would be adjusted as needed to limit disturbance.

The increased opportunities for wildlife dependent recreational opportunities on the Refuge would also have beneficial impacts on the local economy through increased visitation and revenue. Partnerships with county, state and federal agencies, private landowners, and conservation groups would enable the Refuge to achieve goals and objectives, minimize costs, and strengthen relationships.

Implementing the Service's management action is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Order 11990 and 11988, because there would be no development of Refuge facilities within wetlands or floodplains. There would be no effect on threatened, endangered, proposed or candidate species and/or critical habitat, as documented in the intra-service Section 7 (Endangered Species) Consultation completed with the Ecological Services Field Office in Corpus Christi and signed on September 16, 2009. In addition, archeological and/or historical resources would not be impacted.

The Refuge is not aware of any other past, present, or reasonably foreseeable future planned actions that would result in a significant cumulative impact when added to the Refuge's proposed action, as outlined in Alternative B. The adverse direct and indirect effects of the proposed action on air, water, soil, habitat, wildlife and scenery resource values are expected to be minor and short term. The benefits to long-term ecosystem health that the proposed action will accomplish will outweigh any of the short-term impacts discussed in this document.

PUBLIC OUTREACH, REVIEW AND COMMENT

Development of the Aransas National Wildlife Refuge Complex Comprehensive Conservation Plan has been thoroughly coordinated with all interested and/or affected parties. The U.S. Fish and Wildlife Service filed a Notice of Intent to prepare a Comprehensive Conservation Plan in the Federal Register (69 FR 43010; July 19, 2004). This was followed by a Notice of Availability in the Federal Register (74 FR 66148; December 14, 2009) that the Draft Plan/EA were available for 60 days of public review. Subsequently, the Draft Plan/EA were made available for public review starting on December 14, 2009, at the Refuge, at eight local municipal and county libraries in the south Texas area near the Refuge, and at the Regional Office in Albuquerque, New Mexico. Four open house meetings were held in communities near the Refuge in January 2010. In all, ninety-eight (98) individuals signed the attendance rosters at the open house meetings and a total of fifty-two (52) comments were submitted in writing or phoned in to the Refuge/Regional Office. Additionally, one state agency, one university, and six non-governmental organizations responded prior to the end of the 60-day public comment period.

FINDINGS

Based on the analysis documented in the Environmental Assessment and with due consideration given to comments from the public and through consultation with the State of Texas, it is my determination that the proposed action does not constitute a major Federal action that will have a significant effect on the quality of the human environment under the meaning of Section 102 (2) (C) of the National

Environmental Policy Act of 1969 (as amended). As such it is my conclusion that an Environmental Impact Statement is not required for this Plan and the selected alternative may be implemented as soon as practicable. This determination is based on the following factors (40 C.F.R. 1508.27), as addressed in the attached Environmental Assessment.

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the environment. (Environmental Assessment, pages 4-15 through 5-31).

2. The actions will not have a significant effect on public health and safety. (Environmental Assessment, pages 4-18 through 4-20 and 4-25 through 5-31).

3. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas. (Environmental Assessment, pages 4-24 through 4-25 and 5-29 through 5-30).

4. The effects on the quality of the human environment are not likely to be highly controversial. (Environmental Assessment, pages 4-24 through 5-31).

5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment. (Environmental Assessment, pages 4-18 through 4-20 and 4-25 through 5-31).

6. The actions do not establish a precedent for future actions with significant effects nor do they represent a decision in principle about a future consideration. (Environmental Assessment).

7. There will be no cumulatively significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions. (Environmental Assessment, pages 4-15 through 5-31).

8. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources. (Environmental Assessment, pages 4-24 through 4-25 and 5-29 through 5-30).

9. The actions are not likely to adversely affect threatened or endangered species, or their habitats. (Environmental Assessment, pages 4-20 through 4-24).

10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment. (Environmental Assessment, pages 1-3 through 1-6).

It is the intent of the Service to revisit questions of significant environmental consequences in accordance with NEPA upon consideration of the implementation of site specific proposals call for and discussed in the final Plan.

SUPPORTING REFERENCES

Fish and Wildlife Service, 2009. Draft Comprehensive Conservation Plan and Environmental Assessment for the Laguna Atascosa National Wildlife Refuge, Cameron and Willacy Counties, Texas. U.S Department of the Interior, Fish and Wildlife Service, Southwest Region.

Fish and Wildlife Service, 2010. Comprehensive Conservation Plan for the Laguna Atascosa National Wildlife Refuge, Cameron and Willacy Counties, Texas. U.S Department of the Interior, Fish and Wildlife Service, Southwest Region.

Recommended: _____ 9/9/10

Manual Perez III, Refuge Manager
Laguna Atascosa NWR

Date

Approved: _____ 9/9/10

Dr. Benjamin N. Tuggle, Regional Director
U.S. Fish and Wildlife Service, Region 2

Date

Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan
Environmental Assessment

Table of Contents

Environmental Assessment:
Laguna Atascosa National Wildlife Refuge
Comprehensive Conservation Plan

1. Purpose of and Need for the Proposed Action

Prepared under the authority of the National Environmental Policy Act of 1969 (NEPA), this environmental assessment (EA) analyzes potential management alternatives for the development of a Comprehensive Conservation Plan (CCP) for Laguna Atascosa National Wildlife Refuge (NWR) (Refuge). The overall purpose of the CCP is to ensure the continued conservation, management, and enhancement of important fish and wildlife habitats of the United States for the benefit of present and future generations.

The purpose of comprehensive planning is to "...provide the refuge manager with a 15-year management plan for the conservation of fish, wildlife, and plant resources and their related habitats, while providing opportunities for compatible wildlife-dependent recreational uses. The CCP, when fully implemented, should achieve refuge purposes; help fulfill the Refuge System mission; maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System; help achieve the goals of the National Wilderness Preservation System; and meet other mandates." (Service Manual 602 FW 3). The National Wildlife Refuge Improvement Act of 1997 (Act) mandates that the U.S. Fish and Wildlife Service (Service) prepare a CCP for each national wildlife refuge and to involve the public in the planning process. In the Act, Congress identified six priority wildlife-dependent recreational uses (public uses) on national wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Compatible recreational activities are those that will not have a detrimental effect upon fulfillment of the purposes of the refuge or the National Wildlife Refuge System. The purposes of Laguna Atascosa NWR are:

- *"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended;*
- *"...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended;*
- *"...for the development, advancement, management, conservation and protection of fish and wildlife resources...", Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude...", Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.*

The proposed CCP is a 15-year management plan based on the purposes for which the Refuge was created and the Refuge System mission, and it incorporates an integrated, ecosystem approach focused on the long-term protection, enhancement, and restoration of the unique fish and wildlife resources of Laguna Atascosa NWR. This plan will meet the Service's legal and regulatory responsibilities and establish and maintain excellent partnerships in accomplishing the plan's goals and objectives. It is designed to guide

development of opportunities for Refuge visitors to enjoy safe, educational, and compatible wildlife-dependent outdoor recreational activities on the Refuge. The CCP is also intended to address the needs of the local community and the public regarding overall management of the Refuge.

1.1 Decision to be Made

Based on the assessment described in this document, the Service will select an alternative to implement the CCP for Laguna Atascosa NWR. The final CCP will include a Finding of No Significant Impact (FONSI), which is a statement explaining why the selected alternative will not have a significant effect on the quality of the human environment. This determination takes into consideration the Service's and Refuge System mission, the purpose(s) for which the Refuge was established, and other legal mandates. Assuming no significant impact is found, implementation of the CCP will begin and will be monitored annually and revised when necessary.

1.2 Planning Area

Laguna Atascosa NWR lies along the Gulf of Mexico at the southern tip of Texas, along the northeastern edge of Cameron County and the southeastern edge of Willacy County. The 97,007-acre Refuge consists of four main units:

1) Laguna Atascosa Unit, 45,187 acres;
2) Bahia Grande Unit, 21,762 acres;
3) South Padre Island Unit, 24,808 acres; and
4) Coastal Corridor Unit, 5,250 acres.

Within these main units, 8,546 acres are part of the Lower Rio Grande Valley NWR, but they are administratively managed by the Refuge for a total of 97,007 acres. The Laguna Atascosa Unit and main headquarters is located approximately 16 miles east of the town of Rio Hondo, Texas, on Farm-to-Market Road (FM) 106. The Bahia Grande Unit is sandwiched between State Highway (SH)100 and SH 48, about one mile west of Port Isabel, Texas. The South Padre Island Unit, which consists of 21 separate tracts, is located on the north end of South Padre Island, with the first Refuge tract location about 9.5 miles north of the Town of South Padre Island, Texas. The Coastal Corridor Unit currently includes eight separate tracts, including two conservation easements, located between the Laguna Atascosa Unit and the Bahia Grande Unit (*Figure 1*). Laguna Atascosa NWR is part of the South Texas Refuge Complex (STRC), which includes the Lower Rio Grande Valley NWR and Santa Ana NWR.

1.3 Authority, Legal Compliance, and Compatibility

The Service developed this CCP/EA in compliance with the Refuge Improvement Act of 1997 and Part 602 of the U.S. Fish and Wildlife Service Manual (National Wildlife Refuge System Planning). The actions described within this CCP/EA also meet the requirements of NEPA. The CCP's overriding consideration is to carry out the purpose for which the refuges were established. The refuge purposes are stated in the laws that established each refuge and provided the funds for acquisition. Fish and wildlife management is the first priority in refuge management, and the Service allows and encourages public use (wildlife-dependent

recreation) as long as it is appropriate and compatible with, or does not detract from, the refuge's mission and purposes.

Appropriate Refuge Uses Policy

The Appropriate Refuge Uses Policy (Service Manual 603 FW 1) clarifies and expands on the compatibility policy (Service Manual 603 FW 2.10D), which describes when refuge managers should deny a proposed use without determining compatibility. When a use is determined to be appropriate, the refuge manager must then determine if the use is compatible before it may be allowed on the refuge. With the exception of the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation), and the take of fish and wildlife under State regulations, the refuge manager will decide if a new or existing use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility.

Compatibility

The National Wildlife Refuge System Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy Refuge System lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use is one that *"...will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuges."* In addition, *"...wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety."* Compatibility determinations have been completed and are provided in Appendix D of the CCP/EA.

In addition, the Laguna Atascosa NWR Refuge Expansion and Conceptual Management Plan (1999) outlines a plan for Refuge expansion by adding additional lands or conservation easements from willing sellers, up to 108,127 acres of land adjacent to or near the existing 45,187-acre Laguna Atascosa NWR, bringing the Refuge's acquisition goal to 153,314 acres. The actions described in the Expansion Plan have been incorporated into the objectives and strategies of the CCP.

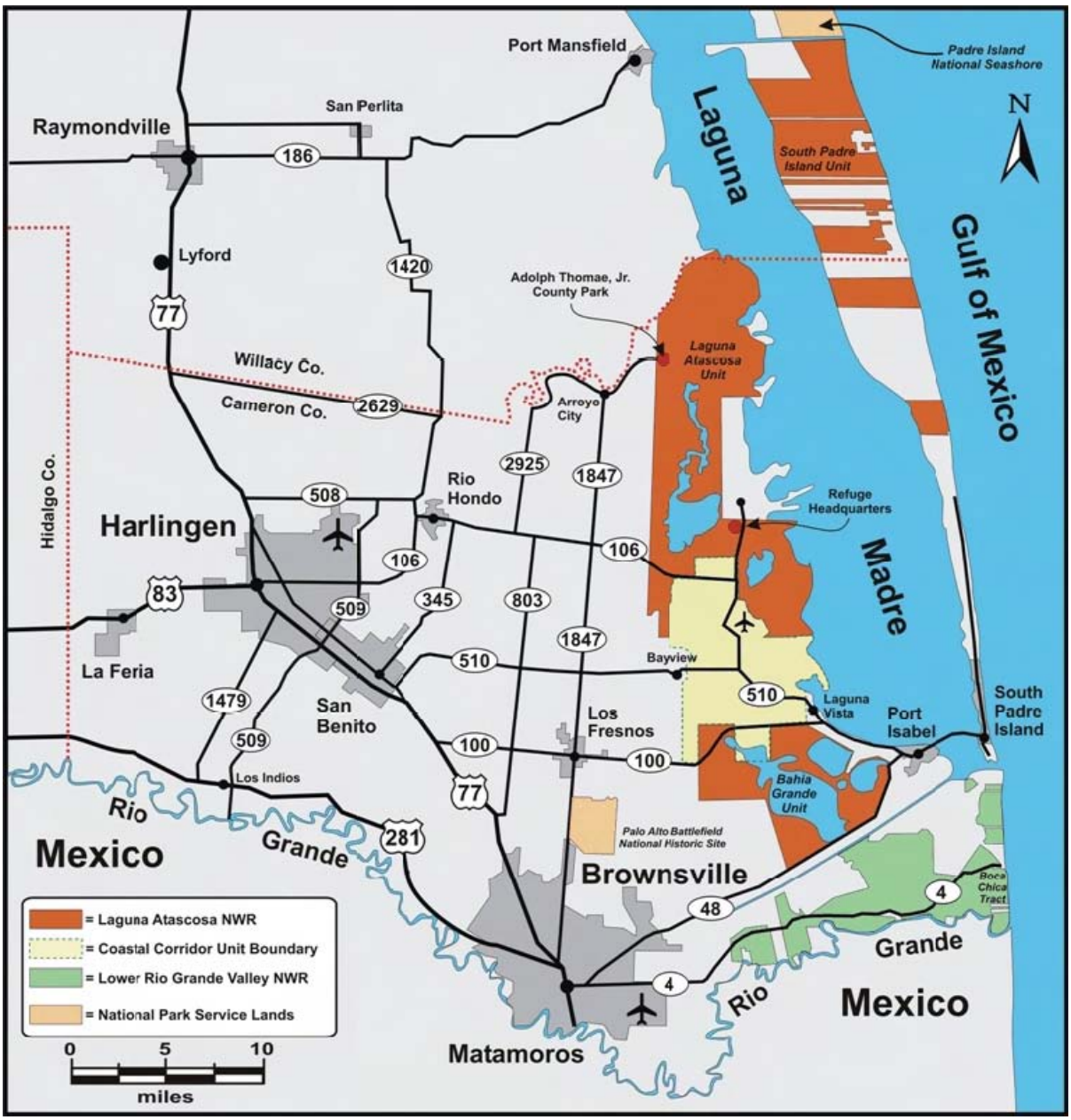

Figure 1. Laguna Atascosa NWR and Vicinity

Public Involvement and Issues

To begin the CCP process, a comment period notification was published in the *Federal Register* on July 19, 2004 (69 FR 43010-11). Draft documents and other relevant information for public review was made available at the Refuge headquarters. Internal pre-planning meetings were held at the Refuge to discuss concerns, issues, and opportunities for the future of the Refuge. Four "open house" public scoping meetings were held between February 28 and March 8, 2005, at Raymondville, Brownsville, Harlingen, and South Padre Island to solicit initial public input and involvement during the early stages of CCP development. Scoping notices with a mail-in response form were mailed to interested individuals, governmental officials, State, Federal, and local agencies, organizations, academia, local libraries, the media, and other stakeholders. The State of Texas (i.e., Texas Parks and Wildlife Department) was also invited to participate as a partner in the planning process on April 12, 2004. All comments received from the public were reviewed and considered throughout the CCP process. A total of 104 people attended these meetings, and 65 written comments were received during the meetings, via mail-in response forms, and from the *Federal Register* notice.

The CCP has identified 10 issue areas (See Section 2.6 of the CCP) that incorporate the gamut of all issues, concerns, and opportunities raised by the public, internally, and by other interested parties,

However, major issues raised by the public centered on:

1. a desire to expand or improve popular activities such as hunting, fishing, bicycling, and hiking (22 percent of comments);
2. support for the continued conservation of rare wildlife resources such as ocelot cats and sea turtles (33 percent);
3. improving infrastructure and access to the Refuge by improving facilities and access roads (20 percent);
4. improving educational and interpretive programs (17 percent); and
5. increasing staffing and funding to improve the quality of the Refuge experience overall (3 percent).

Remaining issues, which were primarily Service issues, concerns, and opportunities, are incorporated into the management direction and are addressed in the environmental consequences section of the EA.

Table 1. Issues Comparison between Alternatives

Major Issues by Public	Alternative A (No Action)	Alternative B (Proposed)	Alternative C (Optimize Public Uses)
Expand Public Use Opportunities	Any expansions would occur opportunistically	Improvement of priority public uses, particularly hunting, fishing, bicycling, hiking, non-motorized boat access, and wildlife observation to meet demand when compatible with wildlife needs and Refuge purposes; expansion of research efforts and dynamic partnerships	Expand and emphasize all priority public uses, particularly hunting, fishing, and access to all Refuge areas to the maximum extent when compatible; based on public comments
Conserve Wildlife and Habitats	Continue ongoing wildlife and habitat management per existing plans and activities	Integrated biological and habitat management efforts with landscape level and ecosystem level plans; emphasis on protection and monitoring of Federal trust species and priority species and their habitats	Continue ongoing wildlife and habitat management per existing plans and activities
Improve Infrastructure and Facilities	Minor upgrades and facilities improvement, as needed and as existing budgets allow	Addition of over 6 miles of hike-and-bike trails; 1 auto tour route; 2 separate parking areas; new visitor center at Laguna Atascosa Unit; visitor contact and research station at Bahia Grande	Several additional miles of auto tour routes, 7 hike-and-bike trails and associated parking areas; visitor contact station; all primarily at Bahia Grande
Improve Environmental Education and Interpretation	Continue ongoing programs and activities	Increase curriculum-specific EE programs and interpretation; hold a minimum of 5 special events and at least 12 presentations annually with an emphasis on reaching diverse student audiences	Continue ongoing programs and activities
Increase Staffing and Funding	Existing staffing (17 permanent positions) and facilities; any additional staff and facility expansions would occur opportunistically	Addition of 20 permanent, full-time staff to existing base, and four seasonal staff	Base funding and staffing would increase by 4 positions (Outdoor Recreation Planner and 3 Park Rangers)

2. Description of Alternatives

Proposed alternatives comprise different approaches or management scenarios for the future management of the Refuge. The alternatives are developed to address the significant issues, concerns, and problems identified by the Service during the public scoping process for the development of the CCP.

2.1 Formulation of Alternatives

Alternatives are different approaches or combinations of management actions designed to achieve a refuge's purposes and vision, the goals identified in the CCP, the goals of the Refuge System, and the mission of the Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service and the public during public scoping. A wide variety of alternatives were considered in this EA. Several alternatives were considered but eliminated from detailed analysis, as discussed in the subsequent text.

Three alternatives are identified and analyzed in detail in this assessment. These alternatives represent different approaches or management scenarios for the future protection, restoration, and management of the Refuge's fish, wildlife, plants, habitats, and other resources, as well as compatible wildlife-dependent recreation. Refuge staff assessed the biological conditions of Refuge habitats and analyzed the external relationships affecting each Refuge unit. This information contributed to the development of Refuge goals and, in turn, helped formulate the alternatives. Each alternative was evaluated based on how much progress it would make and how it would address the identified issues related to wildlife, habitat, and people as described previously and shown in *Table 1*.

2.2 Alternatives Considered But Eliminated From Further Analysis

A wide variety of alternatives were considered in this EA based on public and internal scoping. Those alternatives eliminated from detailed consideration along with the rationale for their dismissal are as follows:

- **Emphasize Threatened and Endangered Species.** The Refuge considered concentrating all efforts and resources on maintaining and enhancing the specific habitats required by endangered or threatened species. Although the Refuge provides resident, wintering, migratory, and nesting habitat for rare or declining species, including federally-listed (threatened or endangered) species, this proposed alternative was not analyzed in detail because current and proposed management actions include sufficient measures to ensure that these species are adequately addressed. In addition, it is the Service's responsibility to conserve and protect threatened and endangered species regardless of which alternative is implemented.
- **Emphasize Waterfowl and Migratory Birds.** One of the primary purposes of the Refuge is providing habitat for wintering waterfowl and other migratory birds. Approximately 38,000 acres or roughly 40 percent of Refuge lands are wetlands and mudflats (excluding the Laguna Madre) that is good habitat for waterfowl and migratory birds. In addition, the Refuge is restoring approximately 10,000 acres of tidal wetlands on the Bahia Grande Unit. As the Refuge provides important habitat for a variety of other wildlife, such as the endangered ocelot, jaguarundi, and

aplomado falcon, a singular management focus on waterfowl and migratory birds alone would not meet Service goals for natural biological diversity and ecological integrity. Regardless of the alternative, the Service is still mandated to protect and provide habitat for waterfowl and migratory birds. Additionally, a complete focus on waterfowl and migratory bird use is therefore likely to hamper or eliminate other important wildlife management needs or directives, such as invasive species control or endangered species concerns. Therefore, this alternative was eliminated from further analysis.

- **Custodial Management Approach.** Some feel that the Refuge should not manage species or habitat, as well as allow public uses. This alternative would call for no active management strategies and close the Refuge entirely to the public through closure of all access roads. Traditional wildlife-dependent public uses (e.g., hunting, fishing, wildlife observation) would be discontinued. Refuge management would consist of allowing access for limited purposes only such as fence repairs that affect adjacent landowners and road maintenance on those roads needed by Refuge staff to conduct minimal enforcement and ensure Refuge closure. However, Refuge management would be reduced to a custodial state. All wildlife populations would remain as is, under existing environmental conditions. There would be no need for staffing or facility improvements. All other Refuge programs, including resource protection and management, endangered species management, and environmental education and interpretation, would be discontinued. As a result, there would be a decrease in the current level of funding and staff. This alternative was rejected primarily because the Refuge is required to comply with legal mandates such as, but not limited to, invasive species management (Executive Order 13112), migratory bird management (Executive Order 13186), and the Endangered Species Act (ESA). Habitat management is often needed to maintain the quality of habitat for wintering waterfowl and breeding birds, and to recover endangered species. Refuge management of habitats and wildlife is necessary to offset or compensate for significant losses of habitat. In the Lower Rio Grande Valley, about 95 percent of the native vegetation has been altered or cleared for agriculture and urban development. Selection of this alternative would also hinder the Refuge's ability to implement all aspects of the Refuge System Improvement Act of 1997, since selection of this alternative would not allow compatible wildlife-dependent recreational activities, as stated in that Act.

2.3 Alternatives Analyzed In Detail

The following alternatives were developed to comply with NEPA and to provide ways to represent a number of issues, concerns, and opportunities that were identified during the public and internal scoping process. Though the alternatives may have a different emphasis, habitat maintenance, restoration, and preservation are common elements of each alternative. The alternatives are intended to provide a range of public uses and access and respond to significant issues or concerns identified during the planning process.

Alternative A: No Action - Current Management

This alternative represents the status quo or no change from current management of the Refuge. Existing or traditional Refuge management practices would continue as they have in

the past, including habitat management (prescribed burning, chemical and mechanical invasive species control), water management, biological inventory, facility and equipment maintenance, staffing, law enforcement, public uses (e.g., hunting, fishing, wildlife observation, hiking, etc.), research, and environmental educational outreach. The Refuge would continue its emphasis on wintering and migratory bird habitat and Federal trust species, and on maintaining public uses of existing facilities and education programs at current levels. Current base funding and staffing levels would allow the Refuge to focus on limited habitat management and maintenance projects.

Habitat Management

Habitat Management on the Refuge primarily consists of prescribed burning and invasive species control (using chemical and mechanical methods). Habitat management includes re-establishment of native brushland in appropriate areas. This is helping to provide more habitat for species such as the ocelot and other brushland wildlife. The Refuge also maintains grasslands for those species that depend on them. Occasional prescribed burns help maintain healthy grassland habitats. Prescribed fire is used as a tool to reduce hazardous fuels (e.g., wildland urban interface), control exotic species, reduce brush encroachment, and enhance or maintain important habitats such as the coastal prairie and savannah (e.g., Gulf cordgrass) for mottled ducks, aplomado falcons, and wintering waterfowl.

Water Management

The water levels on the Refuge's main wetland features, such as Laguna Atascosa and Cayo Atascosa, are controlled seasonally to optimize habitat for a variety of wildlife needs, but primarily for wintering waterfowl and migrating shorebirds. The Refuge manipulates seasonal water levels to provide the greatest variety of uses for such bird groups as dabbling ducks, wading birds, shorebirds, and other waterbirds. Maintaining tidal flows within the Bahia Grande wetland system is one important water management priority, as is the need to provide more freshwater sources on the Refuge. Freshwater is usually in low supply, and the Refuge is completely dependent upon rainwater, irrigation drainage, and surface runoff; therefore, a major objective of water management on the Refuge is to provide a quality, year-round abundance of freshwater for resident and migratory wildlife.

Research

Since so little native habitat remains in south Texas, the Refuge is a center for ecological and conservation research and investigation, particularly endangered felids. The largest U.S. population of ocelots is located on the Refuge, making it the center for ocelot conservation and recovery. Other research, conservation, and management activities involve sea turtles, mottled ducks, reddish egrets, aplomado falcons, shorebirds, amphibians, and other migratory birds.

Wildlife/Threatened and Endangered Species Management

It is the Service's responsibility to conserve and protect federally-listed species; therefore, all Refuge activities are evaluated for compliance with the Endangered Species Act, as amended, through the Intra-Service consultation process. Management actions to protect and provide habitat for endangered species such as the ocelot include monitoring the health of the populations and brush restoration activities. Prescribed burning to maintain grassland habitat

and nest monitoring activities are undertaken to benefit aplomado falcons. From March through mid-July, sea turtle patrols are undertaken, and endangered sea turtle eggs and/or nests are moved to protected areas to facilitate nesting success. Ongoing involvement with the North American Waterfowl Plan and the U.S. Shorebird Conservation Plan would continue at present levels with no foreseeable increases. Law enforcement activities would continue at current levels. Additional biological information on Refuge resources would be obtained through incidental surveys, and appropriate information would not necessarily be available to evaluate current management decisions.

Recreation Opportunities/Public Use

Popular public uses on the Refuge include wildlife observation: watching butterflies at the Visitor Center's butterfly garden or birding—the Refuge is one of the 10 best birding areas in the nation. Other popular public uses include photography, walking trails (self-guided interpretive and other trails), scheduled guided tours, school group tours, camping (limited to Adolph Thomae Jr. County Park, which is located on the Laguna Atascosa Unit), boating and fishing (limited to Adolph Thomae Jr. County Park, South Padre Island Unit, and San Martin Lake on the Bahia Grande Unit), hunting, picnicking, bicycling, and the auto tour routes. There are two auto tour routes and six walking trails varying in length from the 1/8-mile Kiskadee Trail to the 15-mile Bayside Wildlife Drive Loop. The annual white-tailed deer hunt is the largest public hunt in south Texas and continues to be very popular. Each year, 800 archery permits are issued, and a drawing is held to select 235 firearm permits. The Refuge's visitor services staff and volunteers also provide on-site educational outreach, as well as participate in several off-site science, nature, outdoor, career, and birding festivals and shows within the community each year.

Currently, 130,000 to 150,000 people visit the Refuge annually. Recreational opportunities would continue to be limited to traditional programs under existing approved public use plans. Public use facilities would remain essentially the same except for maintenance or necessary improvements. Currently, there are approximately 16.5 miles of public roads and 10.4 miles of interpretive trails. New directional or interpretive signs would not be installed, and except for addressing safety hazards, facilities would not be upgraded. Viewing opportunities for wildlife would be limited to these existing facilities. The current headquarters facilities would remain the same despite anticipated increases in visitation. This alternative would result in access roads remaining as they are with only minor upgrades or maintenance. Any improvements to the visitor services program would occur opportunistically. The Service would rely primarily on efforts by local and State agencies, organizations, universities, and volunteers to accomplish some of its resource protection and monitoring needs.

Cultural and Historic Resources Management

There are no active management activities for cultural and historic resources other than protection of cultural and historical resources. For any projects or activities that involve surface disturbance, archaeological surveys are performed per Service policy.

Oil and Gas Activities and Other Developments

On the Laguna Atascosa Unit, the Federal government owns all of the subsurface mineral rights. Mineral rights on the Bahia Grande, Coastal Corridor, and South Padre Island units

are primarily owned by private persons or third parties. The Federal government and the State of Texas have limited mineral right ownership on the Bahia Grande Unit. Currently, the only oil and gas infrastructure on the Refuge are natural gas pipeline rights-of-way. The Refuge receives numerous requests for oil and gas exploration for privately-owned mineral interests. The Refuge would continue to address oil and gas issues through established procedures at the STRC level for addressing all oil and gas activities (e.g., exploration, production, and transportation) on the Refuge.

Land Acquisition

The Laguna Atascosa NWR Refuge Expansion and Conceptual Management Plan (1999) outlines a plan to buy additional lands or conservation easements from willing sellers; up to 108,127 acres of land adjacent to or near the existing 45,187-acre Laguna Atascosa NWR, bringing the Refuge's acquisition goal to 153,314 acres. The acquisition area is limited to eastern Cameron County (around the Laguna Atascosa Unit and on South Padre Island north of Park Road 100) and Willacy County (South Padre Island).

Partnerships and Cooperative Relationships

The Service intends to continue fostering working relationships with local communities, governments, individuals, neighbors, conservation groups, and other organizations.

In summary, all management programs would continue as they have during the past several years. Although management activities will continue to have beneficial impacts on wildlife, continuing existing strategies and approaches at current levels would maintain existing habitat conditions over the long term. Managers would continue using existing management plans. The lack of publicly accepted goals and resource priorities (as proposed in the CCP) would make it more difficult for management to implement those priorities and obtain funding to make needed improvements.

Alternative B: Proposed Action - Implement CCP

This Alternative was based on public input and the best judgment of the planning team. This is the alternative that would best achieve Refuge purposes, vision, and goals and would best contribute to the Refuge System mission. Alternative B, with associated goals, objectives, and strategies, comprises the Comprehensive Conservation Plan for the Laguna Atascosa NWR.

Alternative B, which is the Service's proposed action, would adopt and implement the actions making up the Refuge's CCP. This includes an emphasis on all Federal trust species (e.g., migratory birds and federally-listed species) and priority species and their habitats within the Refuge, and invasive species control. This alternative also would improve and expand compatible public uses, improve and add new facilities, and enhance educational and outreach programs. The objectives and strategies detailed in the CCP would provide for short- and long-term conservation and enhancement of resources and values on the Refuge, above that of the current management scenario. With State and public input, the actions proposed within this alternative reflect a need to continue and enhance the major goals of resource management and protection, as well as to focus on connecting people with nature through improving the Refuge's environmental education and interpretation programs, and fostering dynamic partnerships.

This alternative will continue to use successful pre-existing Refuge management strategies, as well as a series of new planning strategies to protect, maintain, and restore native brushland, coastal prairies, wetlands, and other biotic communities on the Refuge for Federal trust and priority species. The continued survival of these important resources will keep a unique wildlife heritage for future generations to enjoy in south Texas. Long-range management objectives on the Refuge will be designed to sustain all resident wildlife, plants, and their respective habitats in perpetuity, as well as to provide for the needs of nesting, migratory, and wintering birds.

The Refuge habitat management program would involve implementing active management objectives and strategies such as those described in the CCP and the 2008 Habitat Management Plan. These elements include the hiring of additional biological staff and redirection of existing staff to undertake protection, enhancement, monitoring, and water level management activities. The Refuge's biological program, primarily through the addition of two biological technicians, would increase its emphasis on monitoring, protecting, and enhancing habitat for federally-listed species as well as other important fish and wildlife resources such as migratory birds and waterfowl.

In addition, long range objectives call for redoubling efforts to promote the Refuge and the Refuge System mission by providing the public with quality wildlife experiences through an improved visitor services program. A mix of existing uses and priority wildlife-dependent uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) as described in the CCP will be allowed.

Existing roads, parking areas, and related facilities would be maintained and improved as necessary to accommodate the high visitation of the Refuge. New roads and trails would be constructed on the Bahia Grande Unit. This includes hike-and-bike trails (up to four separate trails totaling over six miles), a wildlife drive, two parking areas, automobile pull-outs, and placement of informational kiosks and signs. A new visitor center is proposed at the Laguna Atascosa Unit, and a visitor contact station is planned for construction at the Bahia Grande Unit. The Refuge would gradually expand educational and outreach programs to meet the increasing visitation and public interest in Refuge environmental education programs. This includes a research field station to be built in conjunction with the Bahia Grande visitor contact station. Improvement of fishing opportunities are also proposed that would include seasonal wade-fishing access to the Laguna Madre at the Laguna Atascosa Unit and fishing access points at Bahia Grande. The hunting program is proposed to be improved to include additional opportunities for the public to hunt feral hogs, exotic nilgai antelope, doves, and quail. Opportunities for waterfowl hunting would also be explored at Bahia Grande. The cumulative impacts of any additional hunting activities will be addressed as part of the hunting chapter of the Visitor Services Plan, a step-down plan of the CCP.

Under this alternative, necessary funding, facilities, equipment, and staff (up to 11 permanent positions) would be added to the existing base. The objectives and strategies detailed in the plan would provide for short- and long-term (up to 15 years) conservation and enhancement of Refuge resources. Many of the management activities and wildlife-dependent recreational uses would require the development of step-down management plans. Implementation of

specific management activities would be phased in over time as described in the appropriate step-down plans and would take into account an "adaptive management" approach.

Other management activities, such as cultural and historical resource management, oil and gas activities and other developments, and partnerships and cooperative relationships, will be the same as in Alternative A. With respect to land acquisition, additional activities proposed under this alternative are to coordinate land acquisition activities with the Lower Rio Grande Valley NWR to establish several wildlife corridors (Ranchito Corridor, South Coastal Corridor, Boca Chica Corridor, North Coastal Corridor, and North Valley Corridor) to establish connectivity between endangered ocelot populations.

Alternative C: Optimize Public Uses

This alternative was developed to address comments received during public scoping. Following the publication of the *Federal Register* "Notice of Intent to prepare a CCP," dated July 19, 2004 (69 FR 43010-11), four informal "open house" meetings held between February 28 and March 8, 2005. This alternative incorporates and emphasizes the public use activities identified by the public. In this alternative, the Refuge will concentrate efforts and resources on public uses to the maximum extent practicable when appropriate and compatible with the purposes of the Refuge.

Under this alternative, wildlife, habitat, or biological diversity activities would essentially be allowed to remain as is. Current base funding and staffing levels would increase by up to four positions (Outdoor Recreation Planner and three Park Rangers), more than the existing staffing level (as in Alternative A). The Refuge would specifically maximize recreational opportunities and conveniences to visitors. Traditional programs such as hunting and fishing would be expanded as much and as often as possible to accommodate these popular activities. For example, the archery hunt would be expanded to include hunting on Management Unit 7. Waterfowl hunting would be proposed for Bahia Grande, provided such a program complies with the stipulations set forth in the Pre-Acquisition Compatibility Determination. However, the cumulative impacts of any additional hunting activities will be addressed as part of the hunting chapter of the Visitor Services Plan. Wade-fishing is proposed at designated areas and during specific seasons along Bayside Wildlife Drive on the Laguna Atascosa Unit. The cumulative impacts of any additional fishing activities will be addressed as part of the fishing chapter of the Visitor Services Plan.

Currently, there are approximately 16.5 miles of auto tour roads and 10.4 miles of interpretive trails. Public use facilities, particularly roads and trails, would be expanded to provide convenient public access. For example, bay access points consisting of pedestrian walkways would be proposed at several locations, along with parking areas on the Laguna Atascosa Unit. Bahia Grande would be developed with at least one wildlife auto tour, at least seven hike-and-bike trails, a visitor contact station, and associated parking areas. Horseback riding would be proposed as well but likely only in areas that are safe from other non-horseback visitors to the Refuge. The Refuge would open up more areas of the Refuge to hunting for white-tailed deer, feral hogs, nilgai antelope, waterfowl, doves, and quail during the appropriate seasons. Additional designated fishing access points would be developed at Laguna Atascosa Unit (Management Unit 7), along Bayside Wildlife Drive and two areas on Bahia Grande, at San Martín Lake, and at the newly established Bahia Grande Channel

entrance. New directional or interpretive signs would be installed along with all new trails, roads, parking areas, and other facilities to add to the demand for convenience by the public.

Other management activities, such as cultural and historical resource management, oil and gas activities and other developments, land acquisition, and partnerships and cooperative relationships, will be the same as in Alternatives A and B.

3. Affected Environment

The affected environment includes the wildlife habitats encompassing Laguna Atascosa NWR and any additional tracts under conservation easement or management responsibility. Currently, a total of 97,007 acres are under the management of the Refuge. A more detailed description of the affected environment can be found in Section 3.0 of the CCP for Laguna Atascosa NWR.

4. Environmental Consequences

This section analyzes and discusses the potential environmental effects or consequences that can reasonably expected by the implementation of each of the three alternatives described in Chapter 2 of this EA. For each alternative, the expected outcomes are portrayed through the 15-year life of the CCP.

This chapter identifies, describes, and compares the physical, biological, and human environment of the three alternatives proposed in this CCP/EA. Current management (Alternative A, the No Action Alternative) provides the basis for comparing the effects of the action alternatives (Alternatives B and C). The direct, indirect, and cumulative effects of each alternative are analyzed in this chapter.

Direct effects are the impacts that would be caused by the alternative at the same time and place as the action. **Indirect effects** are impacts that occur later in time or distance from the triggering action. **Cumulative effects** are incremental impacts resulting from other past, present, and reasonably foreseeable future actions, including those taken by Federal and non-federal agencies, as well as undertaken by private individuals. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time.

An analysis of the effects of management actions on the **physical environment** has been conducted for soils, water and air quality. Analysis of the effects of management actions on the **biological environment** has been conducted for vegetation, wildlife, and threatened and endangered species. Although all plant, animal and fish species on the Refuge are important, many species are not expected to experience any change—or at most, a negligible one—as a result of implementing any of the alternatives. For that reason, not all Refuge species are discussed in this chapter. An analysis of the effects on the **socioeconomic environment** has also been conducted, and ongoing and proposed projects and activities by the Refuge provide positive socioeconomic benefits through job creation (e.g., ecotourism), improving the quality of life, protection of natural resources, and recreational opportunities.

4.1 Definition of Terms

Impact Type

Beneficial impacts are those resulting from management actions that maintain or enhance the quality and/or quality of identified Refuge resources or recreational opportunities.

Adverse impacts are those resulting from management actions that degrade the quality and/or quantity of identified Refuge resources or recreational opportunities.

Duration of Impacts

Short-term impacts affect identified Refuge resources or recreational opportunities; they occur during implementation of the management action but last no longer.

Medium-term impacts affect identified Refuge resources or recreational opportunities and occur during implementation of the management action; they are expected to persist for some time into the future though not throughout the life of the CCP.

Long-term impacts affect identified Refuge resources or recreation opportunities; they occur during implementation of the management action and are expected to persist throughout the life of the CCP and possibly longer.

Intensity of Impact

Negligible impacts result from management actions that cannot be reasonably expected to affect identified Refuge resources or recreational opportunities at the identified scale.

Minor impacts result from a specified management action that can be reasonably expected to have detectable though limited effect on identified Refuge resources or recreation opportunities at the identified scale.

Moderate impacts result from a specified management action that can be reasonably expected to have apparent and detectable effects on identified Refuge resources or recreation opportunities at the identified scale.

Major impacts result from a specified management action that can be reasonably expected to have readily apparent and substantial effects on identified Refuge resources and recreation opportunities at the identified scale.

Context or Scale of Impact

Under the **local scale**, beneficial or adverse impacts on a given resource occur only at a specific project site or in its immediate surroundings and are relatively small in size (i.e., less than 15 acres).

For the **moderate scale**, beneficial or adverse impacts on a given resource occur beyond a specific project site but at a scale below that of the entire Refuge (i.e., 15-100 acres).

Under the **widespread scale**, beneficial or adverse impacts on a given resource extend beyond the moderate scale (i.e., greater than 100 acres).

4.2 Effects Common to All Alternatives

A few potential effects will be the same under each alternative and are summarized under the following categories: environmental justice climate change, refuge revenue sharing, land acquisition, cultural resources, other management, and other effects.

Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was signed by President Clinton on February 11, 1994, to focus Federal attention on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The order directed Federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority and low-income populations. The order is also intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority and low-income communities with access to public information and opportunities for participation in matters relating to human health or the environment.

None of the management alternatives described in this environmental assessment will disproportionately place any adverse environmental, economic, social, or health impacts on minority and low-income populations. Implementation of any action alternative that includes public use and environmental education is anticipated to provide a benefit to the residents residing in the surrounding communities.

Climate Change

The U.S. Department of the Interior issued an order in January 2001 requiring Federal agencies under their direction that have land management responsibilities to consider potential climate change impacts as part of long-range planning endeavors.

The increase in carbon within the Earth's atmosphere has been linked to the gradual rise in surface temperatures commonly referred to as global warming. In relation to comprehensive conservation planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact to be considered in planning. The U.S. Department of Energy defines carbon sequestration as "…the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere…"

The land is a tremendous force in carbon sequestration. Terrestrial biomes of all sorts—grasslands, forest, wetlands, tundra, perpetual ice, and desert—are effective both in preventing carbon emissions and in acting as a biological "scrubber" of atmospheric carbon monoxide. The conclusions of the Department of Energy's report noted that ecosystem protection is important to carbon sequestration and may reduce or prevent the loss of carbon currently stored in the terrestrial biosphere.

Conserving natural habitat for wildlife is the heart of any long-range plan for national wildlife refuges. The actions proposed in this CCP/EA would conserve or restore land and water, and would thus enhance carbon sequestration. This, in turn, contributes positively to efforts to mitigate human-induced global climate changes.

Land Acquisition

Funding for land acquisition from willing sellers within the approved acquisition boundary of the Laguna Atascosa NWR would come from the Land and Water Fund, the Migratory Bird Conservation Fund, or donations from conservation and private organizations. Conservation easements and leases can be used to obtain the minimum interests necessary to satisfy Refuge objectives if the staff can adequately manage uses of the area for the benefit of wildlife. The Service can negotiate management agreements with local, State, and Federal agencies, and accept conservation easements. Some tracts within the acquisition boundaries may be owned by other public or private conservation organizations. The Service would work with interested organizations to identify additional areas needing protection and provide technical assistance as needed. The acquisition of private lands is entirely contingent on the landowners and their willingness to participate.

Cultural Resources

All alternatives afford additional land protection and low levels of development, thereby producing little negative effect on cultural and historic resources. Potentially negative effects could include construction of new facilities and associated utilities. In most cases, these management actions would require review by the Service's Regional Archaeologist in coordination with the State of Texas Historical Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. Therefore, the determination of whether a particular action within an alternative has the potential to affect cultural resources is an ongoing process that would occur during the planning stages of every project.

Service acquisition of land with known or potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by Federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a Federal agency that may affect archaeological or historical resources be reviewed by the State Historic Preservation Office, and that the identified effects be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and to avoid any adverse effects whenever possible.

Refuge Revenue-Sharing

Annual Refuge revenue-sharing payments to Cameron and Willacy counties would continue at similar rates under each alternative. If lands are acquired and added to the Refuge, the payments would increase accordingly.

Other Management and Effects

All management activities that could affect the Refuge's natural resources, including utility lines and easements, soils, water and air, and historical and archaeological resources, would be managed to comply with all laws and regulations. In particular, any existing and future oil and gas exploration, extraction, and transport operations on the Refuge would be managed identically under each of the alternatives. Thus, the impacts would be the same.

Each of the alternatives would have similar effects to negligible effects on soils, noise, transportation, human health and safety, children, hazardous materials, and aesthetic and visual resources.

Unavoidable Adverse Impacts

The selection of any alternative would have no unavoidable adverse direct or indirect impact on the environmental parameters evaluated in this environmental assessment. Any potential adverse effects identified in this assessment have been reduced with mitigation measures to the maximum extent possible.

Irreversible and Irretrievable Commitments of Resources

Most management actions identified in this document will require a commitment of funds that would then be unavailable for use on any other Service projects. At some point, commitment of funds to these projects would be irreversible, and once used, these funds would be irretrievable. Non-renewable or non-recyclable resources committed to projects identified in the CCP, such as fuel for Refuge vehicles, would also represent irreversible and irretrievable commitments of resources.

4.3 Analysis of Impacts by Resource

This section analyzes the direct, indirect, and cumulative environmental and social impacts or consequences that can be reasonably expected by the implementation of each of the proposed alternatives with respect to: *physical environment (soils, water, and air quality), biological environment (fish and wildlife habitat, migratory birds, threatened and endangered species), and socioeconomic environment (local population and economy, recreational and public use, archaeological and cultural resources, and aesthetic and visual resources (See also Table 2).*

Impacts on Air Quality

Alternative A

This alternative involves use of fire as a management tool on the Refuge, which would temporarily create localized air quality impacts. Prescribed fires would be managed and monitored in accordance with Service and local or State policy. Heavy equipment used for road maintenance, mowing, or erosion control might cause a slight, temporary profusion of particulate matter into the air. Under Alternative A, there would be some minor impacts to air quality from vehicle emissions (cars, boats, and machinery), but likely to a lesser degree than Alternatives B and C. No other management actions in this alternative would affect air quality to a significant degree. Habitat management involving prescribed burning will occur only under ideal weather conditions. Smoke management practices will be implemented during all burning events. An approved Prescribed Burn Plan, favorable weather conditions, and adequate firefighting resources all work together to prevent pervasive air pollution or from significantly affecting air and water quality.

Alternative B

Under Alternative B, there would be some minor impacts to air quality from vehicle emissions (cars, boats, and machinery) and local or temporary impacts from prescribed fire. The fire program would be managed and monitored in accordance with Service policy and in compliance with local and State air quality requirements. Burns would be scheduled to coincide with appropriate weather, humidity, and wind patterns to reduce impacts to air

quality. Mechanical operations involving ground disturbance or mowing might cause a slight, temporary profusion of particulate matter into the air.

This alternative involves improving visitor services and facilities, which would increase the volume of traffic on the Refuge. There may also be a temporary decrease in air quality as a result of construction activities. Automobile traffic through the Refuge is not expected to increase to such levels that it would result in measurable pervasive air pollution. Therefore, implementation of this alternative would not significantly affect air quality in the area.

Alternative C

Alternative C involves expanding hunting, trails, and roads, which would increase the volume of traffic within most areas of the Refuge. There may be a decrease in air quality as a result of increased public visitation and/or recreational activities from expanded public uses or visitation. Automobile traffic through the Refuge may increase but likely not to such levels that it would result in measurable, pervasive air pollution. Nonetheless, air quality may degrade somewhat under this alternative.

Impacts on Water Quality

Alternative A

Freshwater is usually in low supply, and the Refuge is completely dependent upon rainwater, irrigation drainage, and surface runoff. Because the Refuge receives farmland and residential runoff water, water quality is an issue in some of the Refuge's major wetlands, such as Laguna Atascosa Lake (Wells et al. 1988); therefore, a major objective of water management on the Refuge is to provide a quality, year-round abundance of freshwater for resident and migratory wildlife.

Herbicide used to control and manage invasive plant species will occur only under ideal weather conditions. Acceptable application practices and guidelines will be implemented during all prescription events and under an approved plan to prevent affecting water quality. Water quality is not expected to be degraded by implementation of this alternative.

Alternative B

There would be some short-term degradation of water quality during infrastructure maintenance or heavy equipment use in wetland systems. However, in the longer term, such projects serve to protect the quality of the watershed by protecting or facilitating natural wetland cycling processes. Water quality is expected to improve upon implementation of the CCP.

Alternative C

There would be some short-term degradation of water quality during infrastructure maintenance or new construction in or near wetlands. This may increase levels of contaminants or other non-natural materials entering the watershed. Maximizing public uses is likely to increase the potential for contaminants on the Refuge, such as trash, fuels, or oils.

Impacts on Soils

Alternative A

The soils on the Refuge, in general, are alluvial clays on the mainland and sandy soils on South Padre Island, which are very susceptible to wind and water erosion. Under alternative A, erosion problems will continue, especially on the lomas on the Bahia Grande Unit. Off-road vehicle use (e.g., ATVs) and the establishment of roads or trails is causing dune erosion on South Padre Island.

Alternative B

New roads and trails would be constructed on the Bahia Grande Unit. This includes hike-and-bike trails (up to four separate trails totaling over six miles), a wildlife drive, two parking areas, automobile pull-outs, and placement of informational kiosks and signs. A new visitor center is proposed at the Laguna Atascosa Unit and a visitor contact station is planned for construction at the Bahia Grande Unit. These activities will result in direct impacts to soil but are considered minimal. Habitat restoration activities on the lomas of the Bahia Grande Unit will help reduce the effects of erosion.

Alternative C

This alternative presents the greatest potential for impacts to soils due to a higher level of planned facility, road, and trail development. At these levels, it is anticipated that soil impacts may be moderate and of longer duration than Alternatives A and B.

Impacts on Habitat

Alternative A

Implementing the No Action Alternative would assume no significant changes in Refuge operations. This alternative offers a strong level of protection for the natural resources of the Refuge without a planned long-term management approach. The restoration and protection of uplands, wetlands, and/or migratory wintering and nesting habitats would continue at current levels, with the exception of Bahia Grande. At Bahia Grande, efforts are currently under way to restore tidal circulation to the tidally-influenced wetland systems there. The habitat management activities implemented on the Refuge are designed to improve habitat conditions for wildlife (primarily wintering and migratory birds). By adopting the No Action Alternative, the Refuge would anticipate no significantly negative impacts to the overall landscape. However, while the existing management would have no negative effects on biological resources, a lack of a strategic context of publicly accepted goals and objectives would make it difficult for Refuge managers to implement resource priorities and justify annual budget requests. Indirectly, this could slow progress toward improving habitat and wildlife conditions. Lack of a long-term plan may also eventually leave Refuge management unprepared to adequately address the potential wildlife impact(s) of future human developments surrounding Refuge lands and to control the spread of invasive or exotic species.

Alternative B

This alternative offers an integrative, publicly-involved, long-term management approach for the Refuge's wildlife populations, habitats, priority public uses, and educational and interpretive opportunities. It involves the expansion of existing efforts for habitat restoration, protection, and enhancement. Active management would primarily involve enhancing existing and adding additional wetlands and water management systems for the benefit of Federal trust resources. Coastal prairie and savannah habitat would be managed with prescribed fire to prevent brush encroachment in these areas. Native brush would be protected and areas restored by re-planting with native vegetation. Invasive species control will occur in all affected habitats, which may include combinations of herbicide, prescribed fire, and mechanical treatment.

Alternative C

By adopting Alternative C, there would be some negative impacts to the overall landscape in terms of more developed areas and greater human presence. Unlike Alternative B, habitat management efforts would not be a main focus; therefore, implementation of Alternative C would likely slow progress toward improving habitat and wildlife conditions. While the existing management would have no negative effects on biological resources, a lack of publicly accepted goals and objectives (as in Alternative A) would make it difficult for Refuge managers to implement resource priorities and justify annual budget requests.

Expanded development of trails and associated infrastructure such as roads and visitor parking areas could lead to minor short-term negative impacts on a small amount of habitat.

Impacts on Wildlife

Alternative A

One of the primary purposes of the Refuge is to provide habitat for wintering waterfowl and other migratory birds; therefore, all habitat and water management activities are implemented for the benefit of wildlife on the Refuge. Migratory birds will continue to receive benefit from the No Action Alternative. Migratory bird populations that use the Refuge are not expected to undergo any significant changes related to this alternative. The direct impacts of any habitat altering activity (e.g., prescribed fire, invasive species control, manipulating wetland water levels, or brush restoration) may include displacement of individual animals and/or habitat loss; however these impacts are expected to be short-term and localized and should not adversely affect native wildlife populations overall. Long-term impacts (e.g., improved habitat quality or more available habitat) are expected to be beneficial. Disturbance to wildlife at some level is an unavoidable consequence of any public use program, regardless of the activity involved. However, the current level of impact from recreational activities (public use) on the Refuge is considered minimal.

Alternative B

Management on the South Padre Island Unit would center around protection activities such as monitoring and boundary posting to help prevent significant disturbance by people, vehicles, and pets. This is particularly true during the summer nesting season for sea turtles

such as the Kemp's ridley, and for Wilson's and snowy plovers, as these birds utilize the South Padre Island Unit's mudflats, beaches, and shoreline areas extensively. Implementation of the objectives and strategies affecting the Bahia Grande Unit would open this unit up to carefully managed priority uses of the Refuge System.

Additional development proposed includes the construction of a wildlife drive and over six miles of hike-and-bike trails. The increase in traffic and human presence is expected to have some negative impacts, such as disturbance and changes in wildlife use patterns, but is not expected to result in significant direct or cumulative impacts that would be incompatible with Refuge purposes. Increased public use would likely lead to more littering, noise, and vehicle traffic. When site development activities are proposed, each activity would be given the appropriate NEPA consideration during pre-construction planning. At that time, any mitigation, if necessary, would be incorporated into the specific project to reduce the level of environmental impacts.

Expanding current levels and/or establishing new public uses will each be reviewed for compatibility with Refuge purposes and the Refuge System mission. The Refuge will also address the cumulative impacts of such uses as hunting and fishing in CCP-associated step-down plans. Hunting, a popular recreational activity on the Refuge, also provides important management benefits, which are geared to positively impact wildlife and their habitats. For example, it is desirable to control exotic species such as feral hogs and nilgai antelope by hunting to reduce or eliminate the damage they impose on fragile native habitats and to prevent these species from competing with native wildlife for food and space. Nonetheless, such public uses (e.g., hunting, fishing) will be carefully managed to ensure that these activities do not adversely impact wildlife populations or conflict with the purposes for which the Refuge was created.

Overall, implementing the CCP would have no known, long-term negative consequences to the Refuge's resources and would produce positive benefits in most key environmental areas. Efforts would be directed toward improving and protecting habitats (e.g., habitat restoration, wetland creation, and water level manipulation) for migratory birds, wintering waterfowl, federally-listed species, and resident fish and wildlife that currently occur or historically occurred on the Refuge.

Alternative C

Increased public use may lead to more littering, noise, and vehicle traffic, which could directly impact wildlife through disturbance, displacement, and potential mortality (road kill). Expanding certain uses such as hunting in additional areas may directly and cumulatively affect migratory birds and other wildlife uses of the Refuge. However, when site development activities are proposed, each activity would be given the appropriate NEPA consideration during pre-construction planning. At that time, any mitigation, if necessary, would be incorporated into the specific project to reduce the level of environmental impacts. Nonetheless, expanding public uses and associated infrastructure would be expected to increase the level of potential disturbance to wildlife and fragmentation of habitat. It would also redirect resources from wildlife and habitat management and restoration activities to developing, managing, and maintaining the expanded visitor services facilities, infrastructures, and programs.

Impacts on Threatened and Endangered Species

Alternative A

Little or no impacts to listed species are anticipated under current management scenarios. Existing protocols for the public use, including hunting, fire management, and wildlife management, has been reviewed, and these activities were determined not likely to adversely affect listed species or their habitats. However, the status quo could slow progress towards implementing important recovery activities and habitat protections. This may hamper important educational and partnership opportunities to further increase support for the conservation of threatened and endangered species.

Alternative B

The Service would actively pursue opportunities to strengthen or improve partnerships and cooperative efforts with other agencies and individuals to improve conservation efforts for the recovery of endangered species. An example is the development of Safe Harbor Agreements for endangered species occurring on private lands. Also under this alternative, systematic biological surveys and inventories of the Refuge's resources would update endangered and threatened species use of the Refuge. Management actions could then be more efficiently implemented to increase enhancement and protection of these Federal trust species and their specific habitats. The CCP proposes improvements to listed species habitats such as establishing and maintaining wildlife corridors between Refuge tracts to connect endangered ocelot populations with each other. Prescribed fires will be used to manage for open grasslands, benefitting such species as the aplomado falcon. Actually, many of the strategies in the CCP are intended to implement specific recovery actions for listed species. They include working with partners, population status monitoring, and "hands on" species and habitat management.

Management concern and requirements under the ESA will remain the same as in Alternative A; however, with greater emphasis on improving a habitat quality using an ecosystem approach to management, there a greater potential for long-term benefits to threatened and endangered species.

Alternative C

Under Alternative C, listed species (ocelot, jaguarundi, aplomado falcon, piping plover, brown pelican, Kemp's ridley sea turtle, and other listed sea turtles) would still be provided protection, as in Alternatives A and B. However, proposed expansions of the hunting program and the construction of new trails and roads may adversely affect federally-listed species and may rise to the level of incompatibility with Refuge purposes. The protection of federally-listed species is a primary concern regardless of the alternative. In general, any expanded public use activities and new trails or roads proposed under Alternative C (just as with the other alternatives) will have to be carefully reviewed for potential impacts to federally-listed species. However, optimizing public uses is likely to result in cumulative habitat degradation and wildlife disturbance, which could adversely affect listed species.

Impacts on Aesthetic and Visual Resources

Alternative A

The No Action Alternative would not affect the existing aesthetic and visual resources on and near the Refuge.

Alternative B

Under this alternative, some viewscapes would be altered by the construction of visitor services facilities such as interpretive panels, trails, parking areas, pull-outs, or other visitor facilities. These facilities would be designed and located for minimal visual intrusion and attractive appearance to the extent possible. Habitat improvement, in general, would gradually but favorably alter views through changes in vegetational cover or assemblages.

Alternative C

Under this alternative, some viewscapes would be permanently altered by the construction of new trails, roads, and parking areas. These facilities would be designed and located for minimal visual intrusion and attractive appearance to the extent possible. However, increased developments and high levels of public use would have some negative affect on aesthetics and, over time, would alter or reduce quality habitats and views through changes in vegetational cover or assemblages. This would be caused by more traffic and more people into more areas of the Refuge, which increases vegetation trampling and straying into more areas. Other factors that can negatively affect aesthetic and visual resources associated with high levels of public use include littering, wildlife disturbance, and vandalism.

Impacts on Cultural and Historical Resources

Alternative A

This alternative would have no known impact on archaeological and historical resources.

Alternative B

Impacts on cultural and historic resources would be evaluated at the time of construction of public use facilities, infrastructure, or other earthmoving activities. There may be archaeological sites unknown to the Refuge. Additional surveys for cultural or archaeological resources would be performed per Service policy.

Alternative C

Impacts on cultural and historic resources would be evaluated at the time of construction of public use facilities, infrastructure, or other earthmoving activities. Known World War II gunnery range structures in the Laguna Atascosa Unit and the cypress pilings at Bahia Grande would be evaluated and preserved as required. There may be archaeological sites unknown to the Refuge that are discovered in the future. Additional surveys for cultural or archaeological resources would be performed.

Impacts on Socioeconomic Resources

Alternative A

The Refuge's contribution to the local economy includes the local benefits of attracting approximately 350,000 visitors annually. For example, in 2002, non-residents spent almost $2.4 million related to their visits to Laguna Atascosa NWR, which resulted in $2.2 million in new economic activity and generated 46 new jobs and $873,400 in payroll (Caudill and Henderson 2002). Additionally, there is the direct expenditure of Refuge resources such as salaries to local employees and the purchase of equipment, services, and supplies from local vendors. For example, Refuge spending in fiscal year 2002 was $844,500; the net economic value visitors derived from their use of the Refuge was $2.7 million; and almost $6.3 million in benefits was derived from maintaining public use of this Refuge (Caudill and Henderson 2002). In the past five years, annual Refuge budget expenditures averaged $972,800, much of which makes its way into the local economy. Refuge Revenue Sharing Act payments from the Department of the Interior are designed to offset the burden that counties feel when Refuge properties are removed from the tax rolls. Laguna Atascosa NWR's tax payments to Cameron and Willacy counties from 2003 through 2005 averaged $87,273 and $16,330 respectively (Source: U.S. Fish and Wildlife Service Realty Division).

No significant change in the local economy or tourist visitation over current levels would be expected as a result of implementing the No Action alternative. Essentially, the economic and social condition of the area would remain the same. The presence and operation of the Refuge provides economic benefits to the surrounding communities within a 30-mile radius in several ways. The Refuge attracts local, national, and some international visitors; and by attracting visitors to the area, the Refuge generates revenue for the local economy. The majority of the Refuge's annual budget is recycled in the local economy through the Refuge staff, purchases with local stores for supplies, equipment repair and upkeep, and contracts for local labor. The local economy would also benefit from Refuge users that provide a vital infusion and recirculation of money into local businesses (e.g., local bait shops, sporting goods outlets, grocery stores, restaurants, hotels, and gas stations). Alternative A would have a general positive impact on the socioeconomic well-being of the local community. No activities proposed in this alternative would have a disproportionate negative impact on low-income or minority populations.

Under this alternative, current programs and facilities would continue to bring visitors to the area and would be expected to continue to generate additional revenues within the community. The Refuge provides full-time employment for 14 individuals who live in the local area and some seasonal jobs. Under this alternative, current management programs would continue to be implemented and no change in Refuge staffing would be required. Alternative A would thus have no net impact on local employment conditions.

Alternative B

The economic benefits would likely improve the local economy through the expansion of programs, staff, budget, and a resultant increase in Refuge visitation and participation in Refuge programs. The potential for increased tourism in the area would thus generate additional revenue for the local economy. No activities proposed in this alternative would

have a disproportionate negative impact on low-income or minority populations. In addition, short- and long-term benefits to employment would occur. Short-term benefits include employment of contractors to construct improvements to structures and facilities associated with the development of the CCP. Long-term employment benefits would occur through the hiring of additional staff members.

Alternative C

The economic benefits under this alternative would be similar to Alternative B in that implementation would likely improve the local economy through an expansion of public uses like hunting, fishing, and wildlife observation and/or through a resultant increase in Refuge visitation. The anticipated increases would thus generate additional revenue for the local economy. No activities proposed in this alternative would have a disproportionate negative impact on low-income or minority populations. Under Alternative C, short-term benefits to employment may occur. Short-term benefits would include local employment of contractors to construct new trails and roads and make related improvements. Long-term benefits would include the hiring of four additional staff (one Outdoor Recreation Planner and three Park Rangers) for optimizing public uses.

Impacts on Public Use

Alternative A

Although visitation is expected to increase in the future, especially at Bahia Grande and South Padre Island, public use opportunities would essentially not change. The Refuge would not specifically improve or expand recreational activities such as hunting, fishing, and wildlife observation and photography above current levels. This would include the likelihood that public use activities or a public use program would not be established at the recently acquired Bahia Grande tract or on any other lands that may be subsequently acquired by the Service. There are currently no public use facilities at Bahia Grande or access to it except for a makeshift fishing area along Highway 48 and San Martín Lake. The only other fishing area on the Refuge with a boat ramp is at the Adolph Thomae Jr. County Park. Public use facilities would remain essentially the same, except for necessary maintenance improvements. However, any increases in current or new public uses would occur opportunistically. Additionally, upgrades or new facilities would occur under current budgeting and planning scenarios, despite expected increases in visitation to the Refuge. Public uses would be limited to current levels.

Alternative B

Based on national trends of increased public use of wildlife refuges, the proposed improvements to visitor services and facilities under Alternative B would encourage more visitation and public use opportunities such as hunting, wildlife observation, and environmental education and interpretation. Therefore, a significant positive impact to public use is anticipated, as the implementation of this alternative is aimed at meeting this increased demand while remaining compatible with Refuge purposes.

Alternative C

The Refuge would maximize opportunities for recreational activities, particularly hunting, fishing, and the addition of new roads/trails for wildlife observation. Several bay access points, an additional designated fishing area, trails, and parking areas would be constructed on the Laguna Atascosa Unit. Bahia Grande Unit would be developed with at least one wildlife auto tour, seven hike-and-bike trails, a visitor contact station, and associated parking areas. Hunting would be significantly expanded, particularly at Bahia Grande, for white-tailed deer, feral hogs, nilgai antelope, waterfowl, doves, and quail during the appropriate seasons. At least two designated fishing areas would be developed. Existing facilities would probably not be upgraded, and the current headquarters facilities would not be improved or expanded to accommodate the anticipated increase in visitors.

Table 2: Effects Summary of Each Alternative

Summary of Effects by Alternative	Alternative A (No Action)	Alternative B (Implement CCP)	Alternative C (Optimize Public Uses)
Impacts on Air Quality	Short-term minor impacts	Short-term minor impacts	Some overall degradation likely to occur
Impacts on Water Quality	None	Improvements to the abundance and quality of freshwater and tidal inflows	None
Impacts on Soils	None	None	None
Impacts on Habitat	Minor short-term direct impacts; beneficial long-term impact; overall, could slow progress on important habitat management activities	Positive benefits anticipated overall; negligible impacts from greater disturbance	Adverse impacts expected over time; cumulative impacts likely
Impacts on Wildlife	No direct impacts; could slow progress on species protection and enhancement	Geared towards species protection and enhancement	May increase disturbance and remove some habitat for wildlife
Impacts on Threatened and Endangered (T/E) Species	No direct impacts; could slow progress on T/E protection and recovery	Long-term positive benefits; greater T/E species protection and awareness	Likely to increase cumulative adverse impacts to T/E species
Impacts on Aesthetic and Visual Resources	None	Slight impacts	Impacts from developments and high levels of public uses
Impacts on Cultural and Historic Resources	None	Not likely	Not likely
Impacts on Socioeconomic Resources	None	Positive benefits, long and short-term	Positive benefits, long and short-term
Impacts on Public Use	Programs remain at current levels and may not meet increasing demand	Significant improvements and expansion to meet increased demand	Maximized improvements and expansion for optimal public use

5. Cumulative Impacts and Mitigation

This section discusses the cumulative effects for all alternatives and mitigation measures. In addition, it provides information regarding consultation and coordination that has occurred with other Federal and State agencies, interested stakeholders, and the public.

5.1 Cumulative Impacts

A cumulative impact is defined as an impact on the natural and human environment that results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-federal) or person undertakes such other actions (40 CFR, Part 1508.7).

Cumulative impacts can result from individually minor but collectively significant actions taking place over time. Implementing Alternative B would reduce the potential for cumulative impacts because of the integrative approach to managing programs. Management actions would be coordinated into the overall management scenario for the Refuge and would be closely monitored. Ecological and biological integrity would be at the forefront of management actions. This would be a change from the issue-by-issue problem solving and separate approach inherent in the No Action Alternative (A). Site-specific activities associated with new construction or enhancement of visitor facilities would be evaluated for NEPA compliance under Alternatives B and C. At that time, any required mitigation activities would be designed into the specific project to reduce the level of unavoidable environmental impacts. Nothing in Alternative A would contribute to either minor or significant cumulative environmental impacts. Alternatives B and C may contribute to some minor cumulative habitat impacts such as new facilities, roads, trails, and wildlife disturbance.

Other cumulative impacts surrounding the Refuge are associated with a rapid increase in development and human populations. The Lower Rio Grande Valley of Texas (LRGV) is characterized by agricultural and urban development, scattered small farming communities, and the seasonal influx of summer visitors and winter residents (i.e., Winter Texans). There are three major metropolitan areas in the Valley. The City of Brownsville, with a population of 139,722 (2000 U.S. Census Bureau), is located about 30 miles south of the Refuge headquarters, along the Rio Grande. Harlingen, located about 25 miles west of the Refuge, has a population of 57,564 (Source: 2000 Census). The third major metropolitan area is McAllen, located about 58 miles west of the Refuge, with a population of 106,414 (2000 U.S. Census Bureau). Overall, the population of the LRGV, which is comprised of Cameron, Hidalgo, Starr, and Willacy counties, has grown from 701,888 in 1990 to 978,369 in 2000, a 39.4 percent increase (Sethi and Arriola 2002). Cameron County grew by 28.9 percent, and Willacy County grew by 13.4 percent during the same 10-year period (Sethi and Arriola 2002). In fact, the LRGV metropolitan area is one of the top 30 fastest growing regions in the nation (Sethi and Arriola 2002).

As a result, specific development activities that are reasonably foreseeable include the proposed construction of a second causeway to South Padre Island. This proposed location may impact the Coastal Corridor Unit of the Refuge by traversing it and, if the causeway is built, would facilitate development of the north side of South Padre Island. This may increase

visitation and impacts to the tracts on the South Padre Island Unit. This causeway may also increase pressure to extend Park Road 100 north toward the Mansfield Cut, which would cut right through the South Padre Island tracts. Additional developments that may occur are additional roads, such as the "northwest corridor" that would link South Padre Island with U.S. Highway 77 and expansion of existing roads such as farm roads to highways that would cross corridors and Refuge tracts. Other development near the Refuge could include unregulated subdivisions (colonias), or urban expansion may affect Refuge tracts by bringing in dogs and cats or by increasing the demand for water, resulting in wildlife habitat loss. The footprint of this development would also affect the aesthetics or the viewscapes that would detract from the natural beauty of the area.

Other impacts include the construction of a border fence along the Rio Grande just south of the Refuge. This fence may indirectly affect wildlife populations by preventing the migration or movement of sensitive wildlife that occur on the Refuge (e.g., ocelot and jaguarundi). West of the Refuge and just offshore are proposals to build wind farms to generate electricity. This may cause impacts to migratory birds and bats that move to and from the Refuge. An increase in the number of desalination plants to provide more water to the area would facilitate large scale development of the area surrounding the Refuge. The lack of freshwater is an issue along the arid south Texas coast due to agricultural and increasing municipal needs. The lack of freshwater may lead to the piping of the open-water canals currently in use. This would result in less water for wildlife and would tend to increase the value of the Refuge to wildlife even more. Intensified agricultural production in the LRGV may include the use of genetically modified crops. It is unknown what effect this may have on native wildlife and plants in the planning area.

There are plans to build a deepwater port by the Brownsville Navigation District that may affect the Bahia Grande Unit due to development of additional infrastructure such as a rail and truck lines and maintenance of the ship channel, which would require dredging and deposition of the spoil material. This is typically deposited on land or used to create spoil "islands." There are plans to expand the Brownsville Ship Channel from the current 200 feet to 400 feet. This may affect the hydrology of the area that may, in turn, affect the quality and quantity of water on the Bahia Grande Unit.

On the Bahia Grande and South Padre Island Units, the mineral rights are owned by private third parties. Therefore, the exploration and development of oil and gas may result in surface impacts from seismic testing to oil and gas infrastructure on these units.

5.2 Mitigation Measures

Mitigation is the last step in a planning process beginning first with avoidance. Nothing proposed in Alternative A would produce environmental impacts of any significance that would warrant mitigatory measures. For Alternatives B and C, the activities listed in the following text serve to reduce the risks of negative effects occurring.

- (Alternative B only) Updated resource baseline data would be gathered to form a current analytical base from which to judge future management impacts and effects.
- (Alternative B only) An extensive and ongoing monitoring program would be developed and implemented to judge management action effectiveness and provide alternative solutions that would lessen any short-term or long-term negative impacts

on fish and wildlife resources and other environmental elements. This is particularly true for proposed hunting, fishing, and boating activities.

- The Refuge would closely regulate and propose actions to adequately address any potential impacts. For example, activities would be conducted during certain times of the year and in areas where breeding and nesting activities are not occurring or are at a minimum. Hunting and fishing would be limited to areas that provide a quality outdoor experience but not to the level that causes a significant, measurable negative effect on resident and migratory wildlife.
- The Refuge would prohibit or restrict activities in areas where listed species occur or CCP activities that may adversely affect federally-listed species. The potential effects of the implementation of the CCP's objectives and strategies on federally-listed species have been reviewed per an Intra-Service Section 7 consultation (See Appendix G).

6. Consultation and Coordination

To begin the CCP/EA process, a comment period notification was published in the *Federal Register* on July 19, 2004 (69 FR 43010-11). This notice can be obtained by key word searching at the *Federal Register* site at: http://www.gpoaccess.gov/fr/index.html. Draft documents and other relevant information for public review will be available at the Refuge headquarters. Internal pre-planning meetings were held at the Refuge in February and June of 2004 to discuss concerns, issues, and opportunities for the future of the Refuge. Four "open house" style public meetings were held from February 28 through March 8, 2005, at Raymondville, Brownsville, Harlingen, and South Padre Island to solicit initial input and involvement from interested parties and stakeholders (Federal, State, and local agencies, groups, organizations, adjacent landowners, and the public) during the early stages of CCP/EA development. The State of Texas was also invited to participate in the planning process on April 12, 2004, and has provided input into the planning process. All comments received from interested parties and the public will be reviewed and considered throughout the CCP/EA process. These comments will be addressed in the final CCP.

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