

DRAFT

Environmental Assessment

**White-winged, Mourning, Eurasian collared Dove and Rock Pigeon Hunt
on
Anahuac National Wildlife Refuge**

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1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION ALTERNATIVE

1.1 Introduction:

The United States Fish and Wildlife Service (Service) is proposing to develop and implement a public dove (white-winged, mourning, Eurasian collared dove, and Rock pigeon hunt on Anahuac National Wildlife Refuge (Refuge). This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposal and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1550-1509) and Department of the Interior (516 DM 8) and Service (550 FW 3) policies. NEPA requires examination of the effects of proposed actions on the natural and human environment. In the following chapters, two alternatives are described and environmental consequences of both alternatives are analyzed.

This EA considers the establishment of dove hunting on the Refuge as originally proposed by the USFWS in the Texas Chenier Plain Refuge Complex Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) (USFWS 2008). Dove hunting on the Refuge would be administered through a Cooperative Agreement with Texas Parks and Wildlife Department (TPWD) under their dove hunt program.

1.2 Location:

The proposed location is on the Refuge, Chambers County, Texas at 29° 40' 13.89" N, 94° 26' 22.38" W, along Farm to Market Road (FM) 1985. The area of impact will not exceed 550 acres and will be located on the Refuge East Unit, ½ mile south of FM 1985. (See Figure 1 below.)

1.3 Background:

Anahuac NWR is located in southeastern Texas and is part of the Texas Chenier Plain National Wildlife Refuge Complex (Refuge Complex). It is composed of coastal marshes and prairies adjacent to the northeastern portion of Galveston Bay. The Refuge was established to preserve and protect migratory birds and other native fish and wildlife and the habitats upon which they depend. Anahuac NWR contains important coastal habitats and teems with an abundance of wildlife including waterfowl, shorebirds, wading birds and other migratory birds, and a thriving population of amphibians and reptiles including American alligators.

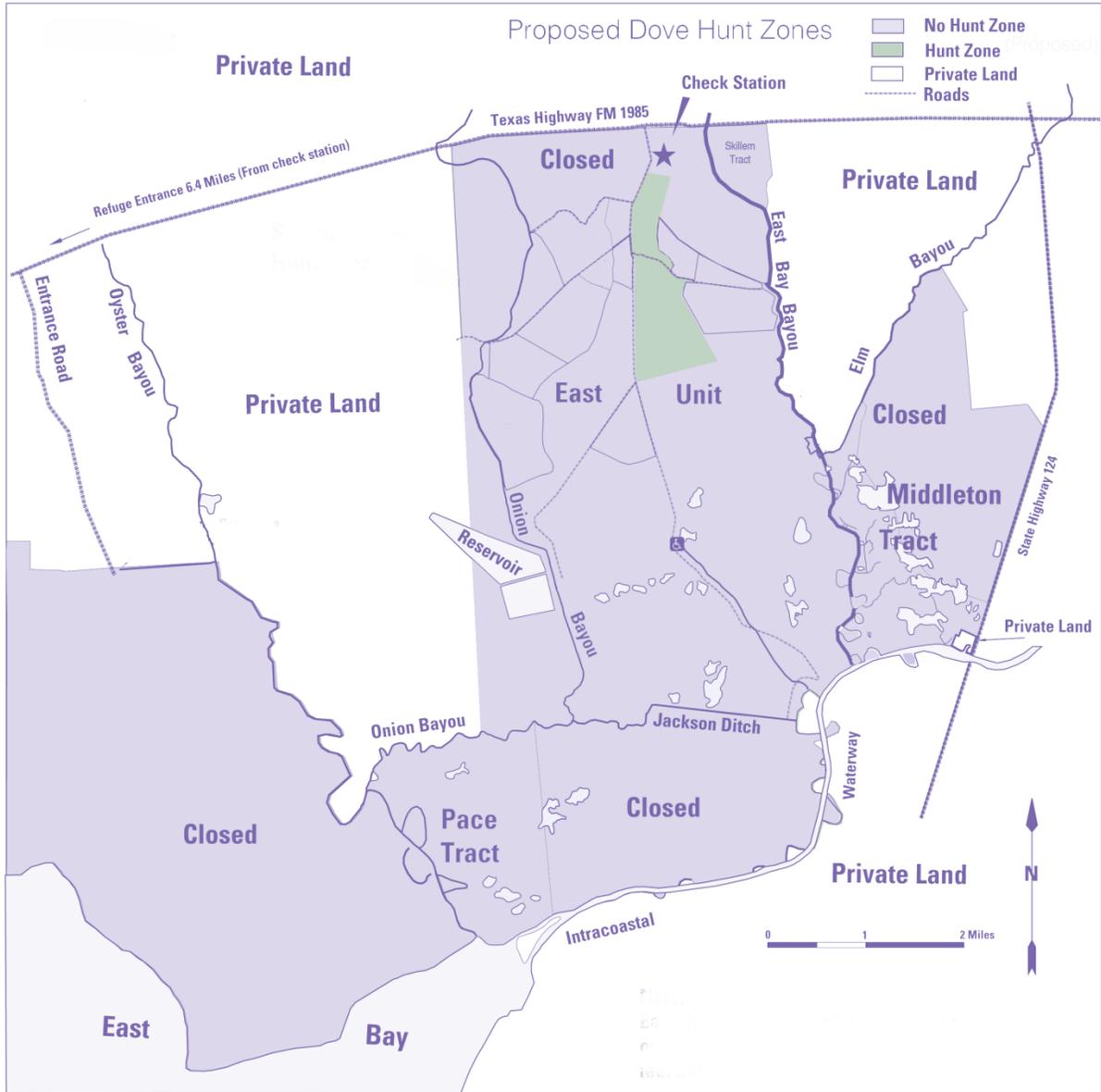


Figure 1. Map of proposed dove hunt area

The Refuge was established on February 27, 1963, under the authority of the Migratory Bird Conservation Act (16 U.S.C. 715d), "...for use as an inviolate sanctuary, and for any other management purposes, for migratory birds." The Refuge is administered by the USFWS, U.S. Department of the Interior, as a unit of the National Wildlife Refuge System. Lands or certain interests in lands added to the Refuge since their original establishment were also acquired under the authority of the Migratory Bird Conservation Act, with the same establishment purpose. Lands have been added to the Refuge under three additional authorities, with the following purposes:

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions..." 16 U.S.C. 3901(b), 100 Sta. 3583 (Emergency Wetlands Resources Act);

"...suitable for—(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." 16 U.S.C. 460K-1 (Refuge Recreation Act); and, "...for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon,..." 16 U.S.C. 661-667e (Fish and Wildlife Coordination Act).

Currently, the Refuge consists of approximately 34,296 acres of coastal wetlands and associated coastal habitats.

1.4 Purpose of and Need for Proposed Action:

The purpose of the Proposed Action is to provide dove hunting opportunities that are compatible with Refuge purposes in designated areas. This will improve wildlife dependent recreation and the quality of the visitor experience on the Refuge, which is a critical component of future management.

Under the National Wildlife Refuge System Improvement Act of 1997, wildlife dependent recreational uses were deemed priority uses of refuges, where these uses are compatible with the establishment purposes of the refuge and the conservation mission of the refuge system.

Hunting is recognized as a priority public use of National Wildlife Refuges. Other wildlife dependent recreation opportunities are also offered on the Refuge. Anahuac NWR typically provides over 70,000 annual visitors opportunities to waterfowl hunt, fish for fresh and saltwater species, observe and photograph wildlife, and learn about this coastal ecosystem through interpretive and environmental education programs.

The purpose of this EA is to evaluate the opening of a selected unit of Anahuac National Wildlife Refuge (Anahuac NWR) to hunting of 4 new species: Mourning Dove, White-winged Dove, Rock Pigeon, and Eurasian Collared Dove.

This action is needed because hunting is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997 and there are limited opportunities for dove hunting on public lands. With more than 97% of the state privately owned (TPWD 2005), limited public hunting opportunities are available in Texas. State and Federal public hunting areas provide important wildlife-dependent recreational opportunities for the general public.

Southeast Texas has a long and rich tradition of outdoor recreation and the Refuge recognizes that dove hunting in Texas is enjoyed by many people. In Texas, more than 200,000 hunters annually take to the field during dove season (USFWS 2013.). The human population in the eight-county area surrounding Houston now exceeds 6 million people, and the Texas Gulf Coast has become a popular destination for national and international nature tourists.

The Refuge does not have the staff to adequately operate another public use program under the current budget and staffing conditions. Since TPWD is currently operating a public dove hunt program on leased private lands and has requested that USFWS open more lands to public hunting, TPWD has offered to operate the proposed dove hunt on the Refuge.

This action is needed to implement the goals and objectives of *Texas Chenier Plain National Wildlife Refuge Complex CCP/EIS* (USFWS 2008).

1.5 Decision to be Made:

The Service's Regional Director will review the recommendations assessed in the EA and select one of the two Alternatives presented. The Regional Director will also determine whether this EA is adequate to support a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement will need to be prepared.

To initiate or expand hunting programs, the Service must publish in the Federal Register any proposed and final refuge-specific regulations pertaining to that use prior to implementing them. The regulations are only one element of a complete opening package, which is comprised of the following documents; hunt plan, compatibility determination, documentation pursuant to compliance with the National Environmental Policy Act of 1969 amended (NEPA) and appropriate NEPA decision documents, Endangered Species Act section 7 evaluation, copies of letters requesting State involvement and the results of the request, draft news release, and the draft refuge-specific regulations.

1.6 Regulatory Compliance:

National Wildlife Refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The mission of the Refuge System is:

“... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Improvement Act of 1997, Public Law 105-57).

The goals of the Refuge System are to:

- *conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered;*
- *develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges;*
- *conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts;*
- *provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation);and*
- *foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.*

The NWRS Improvement Act of 1997 provides guidelines and directives for the administration and management of all areas in the NWRS. It 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 “... 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.” The act also recognized that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, photography, environmental education and interpretation, when determined to be compatible with the mission of the System and purposes of the Refuges, are legitimate and appropriate public uses of the NWRS they shall receive priority consideration in planning and management.

This EA was prepared by the Service and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- Administrative Procedures Act (5 U.S.C. 551-559, 701-706, and 801-808) as amended
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Antiquities Act of 1906 (16 U.S.C. 431-433)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Bald Eagle Protection Act (16 U.S.C. 668-668d) as amended
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*)
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*)

- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*)
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Executive Order 13112, Invasive Species (issued in February 1999)
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*)
- Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421)
- Floodplain Management (Executive Order 11988)
- Migratory Bird Treaty Act (16 U.S.C. 703-712 as amended)
- National Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1550 *et seq.*)
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*)
- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Protection of Wetlands (Executive Order 11990)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*)
- Soil and Water Conservation Act of 1977 (16 U.S.C. 2001-2009) as amended

Further, this EA reflects compliance with applicable State of Texas and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

1.7 Public Involvement and Issues Identified:

Public scoping of the proposed action was originally initiated for the Compatibility Determination on the ANWR Dove Hunt, which has been published with the Texas Chenier Plain Refuge Complex CCP/EIS; this document was available for public review and comment. Formal public hearings on the Draft CCP/EIS were held, at which time comments on the Draft Compatibility Determination were also taken. A Notice of Availability for the Draft CCP/EIS was published in the Federal Register. There were no negative or positive comments related to dove hunting on TCP registered when the CCP/EIS were being reviewed. Since the time span between the publishing of the CCP and the final development of the Dove Hunt Plan was more than 5 years, additional scoping was conducted during the summer of 2014 and again in July 2015. No public comments were received during either scoping period.

Issues:

- The Service sees this as an opportunity to provide another wildlife-dependent recreational activity on the refuge and cooperate with TPWD.
- Representatives from TPWD have requested that the refuge implement a public dove hunt.

2.0 ALTERNATIVES

2.1 Alternative A--No Action Alternative (Current Management):

Under the No Action Alternative, current management direction would proceed. There is currently waterfowl hunting allowed in East Unit adjacent to the proposed dove hunting area. Otherwise, the area is closed to the public. There would continue to be no dove hunt program on Anahuac NWR.

2.2 Alternative B-- Administration of public dove hunt by Texas Parks and Wildlife Department (TPWD) (Proposed Action):

Under this alternative, current management would continue, plus a limited public dove hunt for youth/adult hunters would be added. A youth/adult hunt requires hunters 18 years of age or older be accompanied by a youth hunter 17 years of age or younger. All permitted members of the public may participate in the Youth/adult Hunt in September of each year, with stipulations provided through the public hunt program issued by TPWD. The administrative costs for elements such as public announcements permit issuance, mailings, map publication, and unit signage would be handled predominately by Texas Parks and Wildlife Department. Typical Refuge costs for administration of this alternative would be significantly reduced under this approach.

The proposed dove hunting area is a 550-acre unit within the 17,000 acre East Unit of the refuge. Dove hunting on the Refuge will be administered through a cooperative agreement with TPWD and their “Annual Public Hunting Lease Program.” Opportunities for dove hunting on Anahuac NWR would be available within the State designated season. This dove hunting season generally falls within the month of September and will not extend into the regular waterfowl season. Public hunting of dove would be allowed on designated days and times as a “Youth/Adult” hunt area on the designated 550-acre portion of the Refuge. The dove hunt area will be described in the Texas Parks and Wildlife Department Public Dove Hunting Areas Supplement to the Public Hunting Lands Map Booklet. Means of access to the hunt area will be by foot or motorized vehicle only, however, all-terrain vehicles are prohibited on the Refuge. Motorized vehicles can only be used on designated roads; all other means of travel must be by foot.

Retriever dogs are permitted to be used on the Refuge during the dove hunt, as long as the dog is under the owners’ control at all times. Only non-toxic shot will be allowed in the hunt. This includes any non-toxic shot currently allowed for waterfowl hunting. The Refuge will maintain an active law enforcement presence in an effort to maximize compliance with State and Federal hunting regulations.

Harvest information will be collected from each hunter using standard TWPD dove hunt lease harvest data collection methods and that information will be used to review and possibly revise hunting regulations to enhance the quality and safety of the Refuge’s hunting program. Information will also be gathered to ensure that hunting activities continue to be compatible with Refuge purposes and the mission of the NWRS. The Refuge may choose to suspend dove hunt opportunities if the hunt is determined to cause significant negative impacts to other wildlife or

management issues.

3.0 AFFECTED ENVIRONMENT

The Refuge is composed of coastal marshes and prairies. A complete description of refuge resources can be found in the Texas Chenier Plan NWR Complex CCP/EIS (USFWS 2008). The following resources are not discussed in this EA because the proposed changes in hunting activities are not expected to have any impacts on them: physiography, minerals, visual resource, and wilderness.

Habitat competition between the target species and other wildlife has not been directly studied on the Refuge. The proposed hunt area is located in refuge's East Unit, which is composed of approximately 17,000 acres of coastal marshes and prairies, and is adjacent to the northeastern portion of Galveston Bay. The East Unit is bordered on the west by East Bay Bayou, the east by Onion Bayou, the south by Jackson Ditch, and the north by Farm to Market Road 1985. This East Unit is primarily grasslands, prairie, marsh, rice fields and moist soil units used by waterfowl, shorebirds, wading birds, and secretive marsh birds. The specific unit where the dove hunt is proposed is called 17 ponds field. It currently is composed of grasslands and man-made ponds. The historical topography and vegetative community was destroyed by previous owners agriculture practices. The resources described below are those that could be impacted (directly or indirectly) by the alternative discussed in this document. Competition between species targeted by the hunting program and other wildlife for their habitats is not considered a limiting factor on population size.

3.1 Physical Environment:

Chambers County is a broad, flat, poorly drained plain of about 221,000 ha with slopes less than 3% and elevation mostly less than 11 m.

3.1.1 Air Quality:

The Texas Commission on Environmental Quality (TCEQ) is the state agency responsible for regulating air quality in Texas. The Refuge is within Region 12 of the TCEQ Air Quality Control Area. The major sources of air pollution in these regions are petroleum production, chemical production, shipping, and agriculture. Non-attainment areas are areas that have failed to meet federal standards for ambient air quality. Burning is widely used as an agricultural management tool in the region to improve pasturage and control undesirable vegetation. The TCEQ administers the Outdoor Burning Rule (Title 30, Texas Administrative Code, Sections 111.201 – 111.221), which regulates prescribed burning within the state.

3.1.2 Soils / Geology:

The soils within the proposed hunt area consist of silt loam and clay soils. There is a wide range of textural differences due to the soil origin within historic floodplain systems (USDA 1976). Most of Anahuac NWR is located within the 100-year floodplain.

3.1.3 Water Resources and Quality:

There are no water resources on the proposed dove hunting unit.

3.2 Biological Environment:

3.2.1 Vegetative Communities:

The 550-acre hunt site is the remnant of what was once a much larger coastal prairie plain area but still consists of a broad, flat floodplain. The habitat in this area is coastal prairie that was farmed for rice and remains fallow. It is managed as grassland with grazing and prescribed burns.

3.2.2 Wildlife:

The refuge supports a diversity of wildlife native to coastal marshes and prairies. Over 281 species of birds, 26 species of mammals, and 55 species of reptiles and amphibians have been documented. For a more in-depth review of wildlife, please see the refuge CCP/EIS (USFWS 2008)

Invertebrate populations are an essential food resource for migratory birds and estuarine fishery species. Various amphipods, midges, and crayfish, are present within wetland habitats in the project area. Some of these invertebrate populations occur in tremendous quantities. Multiple species of mosquitoes, midges, dragon flies, and lepidoptera species are other common invertebrates.

Recent surveys have documented 38 butterfly and 16 dragonfly species on the Refuge (USFWS unpublished data).

Doves

Mourning doves, white-winged doves, rock doves, and Eurasian collared-doves are all legal game during the Refuge hunt. Rock doves (pigeons) and Eurasian collared-doves are introduced species, and are not protected by federal or state law. They are usually found in cities and surrounding farm lands and few are present on or adjacent to the Refuge. Mourning doves are migratory birds and are found across much of the United States, and into Canada and Mexico. White-winged doves are also migratory, but their range does not extend much farther north than the refuge and reaches as far south as South America. White-wings are seen regularly through the summer months, but are rarely included in the hunters' bag in September. Mourning doves are highly productive, typically producing several young per year (Baskett et al. 1993).

3.2.3 Threatened and Endangered Species and Other Special Status Species:

No listed species are known to occupy the proposed dove hunting area. A complete list of threatened and endangered species that may occur on the refuge can be found in the CCP/EIS (USFWS 2008).

3.3 Human Environment:

3.3.1 Cultural Resources:

The Refuge has not been fully surveyed for cultural resources. Surveys that have occurred are usually initiated on a project-specific basis, such as for oil and gas or water projects, to comply with the requirements of Section 106 regulations of the National Historic Preservation Act, 36 CFR Part 800. Shell middens are the primary cultural resource identified through previous project-specific surveys. The area proposed for the dove hunt does not fall within any historical-cultural resource areas and was predominantly historically farmed fields. As no infrastructure changes are planned as part of the proposed hunt, a survey is not warranted.

3.3.2 Socioeconomic Resources:

The population of Chambers County was estimated to be 36,812 in 2013, an increase of 4.9% over the 2010 census of 35,096. The largest population centers in Chambers County are Anahuac and Beach City, with populations of 2,243 and 2,198 respectively in 2010.

The labor force in the metropolitan statistical area in Chambers County was estimated at 15,824, approximately 14,337 of which are employed, leaving a 9.4% unemployment rate in 2010. The major employment industries in the county include oil and gas extraction, agribusiness, petroleum refining, and the manufacturing of plastics and resins. The major employers in Anahuac include the Exxon-Mobil, school districts, Beacon Construction, Chambers County and Houston Light and Power.

The 2009 estimated median household income for Chambers County was \$68,478 (U.S. Census Bureau 2010).

The hunt site has several small towns that are within 30-90 miles away, and the Houston Metro Area is approximately 40 miles west of the Refuge. The predominant land uses in the vicinity of the Refuge are grazing, irrigated farming, and some oil and gas development. The Anahuac Chamber of Commerce lists the Refuge as one of the area's main attractions. Anahuac NWR averages about 70,000 visitors per year. The refuge is open for hunting, fishing, wildlife observation and photography, and other wildlife dependent recreation. The refuge also plays a role in the local economy as refuge employees typically live in the community, own property, and support local businesses through routine purchases.

3.3.3 Land Use:

Historically, the land on the proposed hunt area has been used for cattle grazing, rice farming and waterfowl hunting. There is also access to leased property for oil drilling on the Refuge by

navigating roads and waterways on the East Unit. The land in the project area was historically used for agriculture.

3.3.4 Visitor Services/Activities:

The refuge receives over 180,000 visitors annually and provides opportunities for the public in all 6 of the Big 6 uses as outlined by the NWRS Improvement Act of 1997. They include hunting, fishing, wildlife observation and photography, environmental education and interpretation.

Waterfowl hunting is currently allowed on the East Unit adjacent to the proposed dove hunt area. Fishing is allowed in the adjacent bayous. Otherwise, the area is closed to the public.

Hunting

Waterfowl hunting has been a tradition along the upper Texas coast for generations. Prior to the establishment of the refuges, the Refuge was hunted through private ownership or lease. Currently, a variety of waterfowl hunting opportunities are offered on the Refuge, ranging from free, first-come, first-serve programs to a more formal fee system. Different hunt units are open on different days of the week. This is to provide hunting opportunities throughout the entire week while providing periods of rest for waterfowl.

Fishing

Both saltwater and freshwater fishing opportunities are available on Anahuac NWR. Saltwater fishing opportunities on the Refuge are focused along the shoreline of East Galveston Bay (East Bay), where many anglers fish for prized species including red drum, black drum, speckled trout, and flounder. Designated pull-offs along road adjacent to East Bay (Galveston Bay) provide easy access for the public to fishing. Additionally, anglers may fish along West Line Road, and roadside ditches provide opportunities to catch bait for personal use. Crabbing is a popular activity on the refuge as well, especially along roads.

Freshwater fishing opportunities are available on the Refuge along East Bay Bayou. Whether fishing from a non-motorized boat, or along the banks from three small bank piers located on the bayou, anglers here have the opportunity to catch species like crappie, largemouth bass, alligator-gar, bowfin, channel and blue catfish. Also on the Refuge, freshwater anglers may fish along the canal from the Oyster Bayou Boat Ramp to the southwest corner of Shoveler Pond for species like alligator-gar and catfish. Additional information on public fishing opportunities on Refuge may be found within the CCP or on the Refuge website.

Wildlife Observation and Photography

Wildlife inhabiting the coastal marshes, prairies and woodlands on the Refuge Complex are abundant and diverse. Dozens of migratory bird species utilize habitat on the refuges to feed, rest, and nest. Over 27 species of waterfowl can be found throughout the winter months, and flocks of snow geese in excess of 100,000 can sometimes be seen. Spring and fall are prime time

for migrating shorebirds and song birds. On the Refuge, migrating shorebirds primarily utilize moist-soil units and rice fields as their primary habitat. Small and colorful Neotropical song birds can be found in the small woodlands or riparian corridors located primarily on Anahuac NWR. Of special interest to the birding community are the secretive rails that occupy refuge marshes. All six species of North American rails can be found on the Refuge at some time during the year. In addition, resident water birds are visible in wetland habitats throughout the year.

On the East Unit there are wildlife observation and photography opportunities on the East Bay Bayou and the Rookery Reservoir.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes and discusses the potential environmental effects or consequences that can reasonably be expected by the implementation of the alternative described in Chapter 2 of this EA. An analysis of the effects of management actions has been conducted on the physical environment (air quality, soils, and water quality); biological environment (vegetation, wildlife, and threatened and endangered species); and socioeconomic environment (cultural resources, socioeconomic features including public use/recreation, and visitor services/activities). The direct, indirect, and cumulative impacts of each alternative are considered. Potential impacts are described in terms of type, duration, intensity, and context (scale). Please refer to Appendix A for definitions of terms used in this analysis.

4.1 Effects Common to All Alternatives:

4.1.1 Climate Change:

Climate change is already affecting fish, wildlife, plants, and their habitats around the globe. The Service's Southwest Region has been working with the U.S. Geological Survey, the academic community, and other natural resource management agencies and interest groups to translate available and emerging science into concrete actions that reduce the impacts of a changing climate on the broadly diverse ecosystems in Arizona, New Mexico, Oklahoma, and Texas.

The Refuge believes that its hunt program will have negligible impacts on Climate Change; however, much is unknown about this subject. The Service has recently addressed the subject of Climate Change with the issuance of the publication "Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change." This five year plan calls for developing long-term processes and protocols for biological planning and conservation at broad, landscape scales. This five year action plan calls for baseline data to be established. Refuges to date have no information or data regarding their carbon footprint. This subject will be further addressed as future direction is developed and provided on how to step this Strategic Plan down to the field level.

4.1.2 Impacts on Cultural Resources:

For both alternatives, there are no anticipated direct or indirect impacts to the cultural environment, as current conditions would be maintained, and no ground disturbance would occur.

4.1.3 Impacts on Water Quality and Quantity:

There are not water resources within the proposed hunt area, so no impacts are anticipated..

4.1.4 Impacts on Threatened and Endangered Species :

No threatened and endangered species are not to use the area, so no impacts are anticipated.

4.1.5. Environmental Justice:

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill 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 their 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 residents access to public information and participation in matters relating to human health or the environment. This EA has not identified any adverse or beneficial effects for any alternative unique to minority or low-income populations in the affected area. Additionally, none of the alternatives will disproportionately place any adverse environmental, economic, social, or health impacts on minority or low-income populations.

4.2 Physical Environment:

4.2.1 Impacts on Air Quality:

Alternative A--No Action Alternative:

No impacts to air quality are expected from continuation of current hunting program management. The refuge has approximately 2000 hunters per year for waterfowl hunts. Use on the refuge is considered low. Hunter traffic on roads to the refuge may cause a very slight increase in air quality due to vehicle emissions and the stirring of road dust. These impacts are expected to be, negligible, short-term, and local because the small number of vehicles at an average of 2.5 hunters per vehicle, therefore, there would not be a noticeable change in air quality.

Alternative B--Proposed Action:

Impacts similar to A but with the addition of dove hunting on the refuge. Levels would increase, but this increase is expected to be negligible. The proposed action may result in some short-term negative impacts at a local scale, as a result of the increase of vehicles that will frequent the Refuge. Temporary impacts to air quality from dust and emissions produced by vehicles would be minimal and would be undetectable after the hunt season is implemented.

4.2.2 Impacts on Soils:

Alternative A--No Action Alternative:

Under Alternative A, the new hunt unit would not be open, so there would be no impacts to soils.

Alternative B--Proposed Action:

The proposed action would result in some disturbance to surface soils (compaction by foot traffic.). Impacts are expected to be short-term and, minor because hunter density will be low during hunting season (approximately one hunter per 25 acres). Vehicles would be confined to public access roads and parking areas. ATVs are not allowed. Only approved non-toxic shot would be allowed to eliminate the potential for any residual soil quality impacts from lead. Stipulations requiring hunters to remove all litter will reduce this to a minimal level. Impacts are expected to be negligible.

4.3 Biological Environment:

4.3.1 Impacts on Vegetation:

Alternative A--No Action Alternative:

No impacts to vegetation are expected from continuation of current management.

Alternative B--Proposed Action:

Adding dove hunting is expected to have short-term impacts on no more than 550 acres of coastal grassland habitat. Short-term impacts to habitat would be due to trampling of vegetation by dove hunters (1 hunters per 25 acre) while walking in the field. Any vegetative plantings for prairie restoration within this unit would not be impacted by the limited trampling that will occur, but these impacts are expected to be negligible.

4.3.2 Impacts on Wildlife:

Alternative A--No Action Alternative:

Under the No Action Alternative, the existing habitat conditions would be maintained. There would be no change in diversity or abundance of wildlife that use the area.

Alternative B--Proposed Action:

There would be some short-term adverse impacts on small mammals, birds, and other wildlife due to disturbance related to the hunt season. The possible short-term decline in dove numbers is not expected to be enough to affect the area, regional, national, or overall continental population.

Non-target bird species would be expected to utilize additional energy in fleeing the vicinity of the dove hunters; however, sufficient additional habitat is available across the refuge and impacts should be short term and minor.

4.4 Human Environment:

4.4.1 Impacts on Socioeconomics:

Alternative A--No Action Alternative:

The economic and social condition of the area would remain the same. The Refuge would continue to be one of the area's main attractions. 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, revenue is generated for the local economy. Much of the Refuge annual budget is recycled into local businesses through refuge staff, purchases of equipment and supplies, as well as contracts for local labor to accomplish refuge projects. The Refuge provides full-time employment for 24 individuals that live in nearby communities.

Alternative B--Proposed Action:

Overall, the economic and social condition of the area would remain relatively the same. However, there would be short-term positive benefits to the local economy during dove hunt season since hunting supplies and other materials could be purchased locally and hunters may also utilize restaurants and temporary lodging options located in the general area.

4.4.2 Impacts on Visitor Services/Activities:

Alternative A--No Action Alternative:

There would be no change to the existing hunting, fishing, wildlife observation and photography, environmental education or interpretation programs.

Alternative B--Proposed Action:

This action would result in increased opportunities for wildlife dependent recreation. Increased unsatisfactory visits could also occur due to conflicts between user groups. Photographers, birders and other non-consumptive users on nearby units that are open to the public may hear the shotguns. Volunteers at the Refuge RV volunteer sites will experience some increased noise disturbance due to the close proximity of the hunt area. The duration of the hunt season will minimize this disturbance to a week in length. Hunt unit is not open to the public so no other users would be impacted.

4.4.3 Impacts on Public Health and Safety

Alternative A – No Action Alternative:

Under current management public health and safety risks are minimal because the refuge employs multiple safety rules and regulations (CFR Reference). All other public uses are restricted from use of the hunting units during the waterfowl hunt season. There is only a slight

chance of hunting accident as refuge hunter densities are strictly limited. There would be a several/many hunters spread out over the refuge waterfowl hunt units. There is a slight chance of a firearms accident to another hunter or themselves. The risk of accident on the refuge would continue to be minimal.

Alternative B – Proposed Action:

Under this alternative, impacts to public health and safety would be similar to Alternative A.

4.4.4 Impacts on Refuge Facilities

Alternative A – No Action Alternative:

Damage to roads and parking facilities from hunters would continue at the current level, which requires some grading of roads and maintenance of facilities. Other wildlife-dependent users would also continue to use refuge facilities, thereby necessitating periodic maintenance throughout the year. Other facilities and fences would not be affected.

Alternative B – Proposed Action:

Under this alternative impacts would be similar to Alternative A. With the addition of the new hunt there would be a minimal increase in impacts from vehicle traffic from hunting for an additional 30 days.

4.4.5 Humaneness and Animal Welfare Concerns:

Alternative A – No Action Alternative:

Under this alternative, mortality of goose, ducks and coots would occur. Accurate, clean shots are expected. The target should be within the effective range of the firearm and the skills of the hunter: a humane kill likely.

Alternative B – Proposed Action:

Under Alternative B, impacts would be the same as Alternative A with the addition of mortality of white-winged, mourning, Eurasian collared doves and rock pigeons.

4.5 Assessment of Cumulative Impacts:

A cumulative impact is defined as an impact on the environment that results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future action regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can accumulate spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially cancelling out each other's effects on a resource. More typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

4.5.1 Anticipated Direct and Indirect Impacts of Proposed Action Alternative on Wildlife Species:

Anahuac NWR falls within the regulations of the south zone, according to TPWD, for dove hunting. This zone is from the section of the state south of the International Toll Bridge in Del Rio, follows northeast along U.S. Highway 277 Spur to U.S. Highway 90 in Del Rio, and then east along U.S. Highway 90 to State Loop 1604. It then follows Loop 1604 south and east, continuing north to Interstate Highway 10 and then keeping on east to the Texas-Louisiana state line.

Legal dove hunt game in Texas, according to TPWD, are mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), rock pigeon (*Columba livia*), and Eurasian collared dove (*Streptopelia decaocto*). Texas has the nation's largest dove population; an estimated 26.55 million breeding pairs in 2014 (USFWS, Office Migratory Bird, 2014). Even though the numbers of birds that are actually harvested don't have a long term effect on the dove populations, lead poisoning does, and is documented as a problem. To address this issue and halt any further impact, it will be required that all hunters use non-toxic shot during their hunt on Refuge.

4.5.1.1 Resident Wildlife:

Currently, no hunting of resident wild occurs in the East Unit. Note: Mottled ducks, black-bellied whistling ducks, fulvous whistling ducks and blue-winged teal are resident species, are discussed in the waterfowl section (4.5.1.2)

Other (Non-hunted) Resident Wildlife

There should be minimal direct disturbance to resident wildlife by hunters. Indirect effects are minimized due to the use of non-toxic shot by hunters, preventing accidental ingestion by scavengers of lost downed birds. (Haig, et al. 2014)

Other resident wildlife species are also present on the Refuge, including songbirds, wading birds, and raptors; small mammals such as voles, moles, mice, shrews, and bats; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Most of these species are common and widespread. In general these species are broadly distributed throughout the region and have limited home ranges. Hunting is not expected to affect any wildlife populations regionally. Some wildlife disturbance (increased human presence and sounds of gunshots) will occur locally during the hunting season. These impacts are expected to be minor because collectively, the Refuge will only be open to dove hunting for a total of 16 days per year.

Dove hunting takes place in a concentrated area and interactions with, or impacts to, other non-hunted resident wildlife may be locally high (within 20 to 30 acres) but will not affect wildlife outside those concentrated areas.

Small mammals, including bats, become less active during winter when Big Game and Upland Game hunting season occurs, and many of these species are nocturnal. Both of these characteristics reduce/eliminate hunter interactions with small mammals. Hibernation or torpor by cold-blooded amphibians and reptiles also limits their activity during the winter months when hunting occurs. Hunters would rarely encounter amphibians and reptiles during most of the hunting season. Encounters with amphibians and reptiles would be greater during early fall but should not have cumulative negative effects on amphibian and reptile populations. Invertebrates become less active during the fall and winter months and there would be few interactions with hunters during the hunting season.

4.5.1.2 Migratory Species Analysis:

Migratory species present on the refuge (more than 240 species) include waterfowl, other water birds, neotropical migrant birds and raptors.

Observation from refuge staff, and TPWD estimates, indicates that dove populations vary daily from less than a hundred to several thousand, depending on what part of migration is occurring. These numbers are sufficient for limited public hunting. If populations, habitat, or hunter success rates significantly change or effect wildlife populations, modifications to the hunt program will be addressed as soon as possible. Anahuac NWR may suspend dove hunting in any given year to reduce or eliminate any negative impacts to the refuge or hunt area.

Executive Order 13112, Invasive species, issued in February, 1999 instructs Federal Agencies to: prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species populations accurately and reliably; provide for restoration of native species and habitat conditions in ecosystems that have been invaded; conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and promote public education on invasive species and the means to address them.

Mourning Dove

Regional Analysis- Nationwide, hunters (850,000) only harvested about 5.6% of the total dove population (274 million) in 2013 (Seamans, M. E. et al, 2014).

Local Analysis- The total population for the state of Texas is 26.55 million. The Gulf Coast Plains eco-region itself has 5.7% (1.52 million) of that population in 2013 (Oldenburger,S.L.et al. 2014)..

White-winged dove

Regional Analysis- US populations are estimated to be around 19 million in 2013 (Seamans, M. E. et al, 2014).

Local Analysis- The total population for the state of Texas is 6.77 million. The Gulf Coast Plains eco-region itself has 0.7% (48,600) of that population in 2013 (Oldenburger,S.L.et al. 2014)..

Rock pigeon

Rock pigeons are an invasive species with a US population of ~8.4 million.

The hunting of Rock and Eurasian collared dove is not considered detrimental to the biological integrity of the Refuge, is not likely to create conflict with other public uses, and is within the wildlife-dependent public uses to be given priority consideration. In fact, the removal of as many of these destructive invasive species as possible would positively benefit the Refuge (and neighboring) habitat.

Executive Order 13112, Invasive species, issued in February, 1999 instructs Federal Agencies to: prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species populations accurately and reliably; provide for restoration of native species and habitat conditions in ecosystems that have been invaded; conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and promote public education on invasive species and the means to address them.

Eurasian collared dove

The Eurasian collared doves are an invasive exotic species increasing in population by ~15% each year. This species was first documented in Texas in 1995 and now are breeding in every county in Texas.

Local analysis- The total population for the state of Texas is 2.8 million. The Gulf Coast Plains eco-region itself has 4.4% (124,300) of that population in 2013 (Oldenburger,S.L.et al. 2014)..

The limited numbers of hunters and the shortened length of this proposed hunt should not cause any significant or long-term conflicts with any other species of animals found on the refuge. If it is determined that there are excessive disturbances to non-targeted species, changes will be made by restricting some uses to include: reducing amounts of the hunters, reducing days allowed to hunt, or restricting open hunt areas. Refuge law enforcement officers will make every effort to maximize protection of other non-targeted species.

Data for TPWD Public hunting areas utilized for dove hunting was analyzed from the 2012 to 2014 dove hunting season. Average number of dove hunters using each of the TPWD Type 2 hunting areas in the surrounding 3 counties during a season within this period was 15.3 hunters annually. Maximum number of hunters using one area on a given day was 20. This maximum number appearing on Anahuac NWR would average to 27 acres per hunter. (TPWD personnel communication)

Total number of doves harvested in these 3 years across all of the 17 TPWD Type 2 hunt areas that were open for dove hunting during this period within this 3 county zone was 857 birds.

Average numbers of doves harvested per hunt area on all areas during the three year period was 50.4 doves. (TPWD personnel communication)

Average number of days each of the TPWD Type 2 hunt areas were used for dove hunting was 22.7 days or 28% of the total days the season was open for dove hunting. (TPWD personnel communication)

Other Migratory Species:

Much of Anahuac NWR is used by various species of waterfowl. Mottled ducks are listed as a species of concern for the USFWS Office of Migratory Birds and measures have been incorporated into the proposed dove hunt to reduce disturbance. Differences in duck densities among sanctuaries and hunted Wildlife Management Areas in the Mississippi Alluvial Valley (St. James, 2011) are consistent with varying levels of disturbance (Hockin et al. 1992; Madsen 1998 *a,b*), however, the proposed dove hunt does not occur in the same habitat as waterfowl typically use. The dove hunting unit will be on predominantly dry upland locations, not in wetlands or actively managed moist soil habitats preferred by waterfowl. Some dove hunting occurs around isolated and drying ponds that attract doves seeking a drink. Little information is available on the disturbance effects in adjacent areas to upland hunting pressures. The addition of upland dove hunting activity in the East Unit is expected to result in potential for some localized disturbance to waterfowl near the hunt area. The hunt area location is situated away from the lower marsh and not near large wetlands areas. The early dove season split is concluded before the start of regular waterfowl season. The short duration of the proposed hunt should further reduce the chance of any persistent displacement of waterfowl from the area. Additional protective measures may be added to the proposed hunt if the hunt results in alteration of waterfowl use of early season sanctuaries on the East Unit of the Refuge. Management of rice fields adjacent to the dove hunt area will be focused in a manner that will help minimize use of these fields by mottled ducks and other waterfowl during the dove hunting season by keeping the fields dry during harvest until after the end of the proposed dove season. This will reduce any potential of impacts to the mottled duck population and other early season waterfowl migrants.

There are a number of shorebird species that use Anahuac NWR as nesting grounds, particularly wetlands and upland areas (Powers and Hudson 1996). Anahuac NWR serves as a migration corridor for many species of shorebirds that begin migration as early as late June and continue into late September. The dove hunt will be administered adjacent to where shorebirds may occur and hunter actions may impact these areas due to disturbance. However, impacts will be minimal because of the restricted amount of use and the amount of other available shorebird habitats in adjacent areas. Shorebirds may be flushed and will move to other areas of similar habitat that are closed to hunting on the East Unit. Indirect disturbances that may affect shorebirds are believed to be noise and visual disturbances caused by increased use of the dove hunt area. These disturbances would also be minimal as habitats outside the hunt area will be actively managed for moist soil conditions preferred by shorebirds

There may be incidental disturbance to other migratory species found within the designated hunt unit from hunters coming into an area occupied by them or noise from firearm discharge. (Pease, M.L. et al, 2005). However, this effect should be negligible, given the amount of habitat that is available on the refuge outside of the hunt unit. With the use of non-toxic shot there is no risk of

lead poisoning thru incidental ingestion (Haig, et al, 2004). Or secondary ingestion by raptors (McBride, et al, 2004).

4.5.1.3 Endangered Species and Species of Concern:

It is the policy of the Service to protect and preserve all native species of fish, wildlife, and plants, including their habitats, which are designated as threatened or endangered with extinction.

Regional Analysis

The proposed action is not expected to impact threatened and endangered species.

Local Analysis

None of the current or projected future lands within the acquisition boundary of the refuge have been designated critical habitat for any species listed as endangered under the Endangered Species Act of 1973, as amended.

Differences in duck densities among sanctuaries and hunted WMAs in the Mississippi Alluvial Valley (MAV), are consistent with varying levels of disturbance (Hockin et al. 1992; Madsen 1998 *a,b*). Density of dabbling species, with ecologies similar to the mottled duck, increase in sanctuaries across the hunt season. Findings by St. James suggest that ducks may have been using spatial sanctuaries even when temporal sanctuaries were available. Findings from the MAV indicate that a hunt season on dove on Anahuac NWR may affect movements and habitat use of the mottled duck, which is a species of concern for the USFWS Migratory Bird Office, and other early waterfowl migrants to the area. Management of rice fields adjacent to the dove hunt area will be focused in a manner that will help minimize use of these fields by mottled ducks during the dove hunting season by keeping the fields dry after harvest until after the end of the dove hunt season. This will reduce any potential of impacts to the mottled duck population and other early season waterfowl migrants.

4.5.2 Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources:

Other Wildlife-Dependent Recreation

The majority of the recreational visitation occurs between October and May annually, which is during the winter bird migration, when opportunities to observe and photograph wildlife are at their peak. Since the proposed dove hunts will be held in the early fall, it is projected that refuge visitation will be much lower than the winter and spring months. The hunts will occur in areas otherwise closed to the public that only had 4305 visitors engaged in waterfowl hunting during 2014. This area is further separated from the main public use areas on the refuge by an average of ¼ of a mile or greater on each side. Fishing is prohibited year round in the areas where the dove hunt would be conducted. Considering the seasonal and spatial separation of the major public uses at Anahuac NWR, there is no overlap in the proposed hunt area; therefore, no foreseeable public use conflicts are expected.

Refuge Facilities

The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.”

Because the hunt unit, and the refuge in general, is closed to vehicular traffic; the only infrastructure at risk of impact due to No Action or Alternative B, would be to the access road, the parking area, and the hunter sign-in stations. These impacts are expected to be minimal/moderate due to the small/moderate/large amount of hunters that utilize the refuge.

Under the proposed action those facilities most utilized by hunters would be public roads. These roads are currently used to accommodate Refuge management operations and general public use. The addition of these limited hunts would slightly increase vehicular traffic; however, impacts on these facilities would be minor in the short term and over time. Periodic maintenance or improvement of the road would cause minimal negative impacts as the volume of hunters and the amount of hunter use would be light. With no new roads or parking areas required for the proposed hunts, costs should be minimal relative to total Refuge operations and maintenance costs and would not significantly diminish resources dedicated to other Refuge management programs.

Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an “undertaking” that triggers a federal agency’s need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1. An undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and
2. The project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes is, therefore, not required.

4.5.3 Anticipated Impacts of Proposed Hunt on Refuge Environment and Community:

Negative impacts to the Refuge environment associated with the proposed hunting activities will be minor. It is expected that some minor disturbance to soils and vegetation will occur as a result of people engaging in the proposed hunting activities. Air quality will experience minor/major impacts due to increased fossil fuel emissions as people travel to and from the hunt unit.

The impacts of allowing additional hunting opportunity may include disturbance of non-target species in the hunt areas, trampling of vegetation, and the possible creation of temporary paths by hunters, subsequent erosion, or littering. Refuge staff would control hunter access to minimize any impacts. Hunts would be monitored for impact on Refuge resources and, if any are found, appropriate adjustments would be made to eliminate them. Any future negative cumulative impacts to the Refuge environment would be further reduced by appropriate regulation(s). Collectively, these actions are anticipated to result in minor cumulative effects to the Refuge environment.

Lands adjacent to the refuge are predominantly agricultural and sparsely populated, and hunting is a common past time in the area, so the brief increase in activity on the refuge would have little effect on the public, visitors, and nearby residents.

The economic impact of the proposed hunt program would increase slightly with minor increases in sales of licenses or ammunition.

4.5.4 Other Past, Present, Proposed and Reasonably Foreseeable Hunts (and Other Activities) and Anticipated Impacts:

Past

Historically, the land on the proposed hunt area has been used for cattle grazing, rice farming and waterfowl hunting. There is also access to leased property for oil drilling on the Refuge by navigating roads and waterways on the East Unit. The land in the project area was historically used for agriculture. There has been no hunting on the proposed unit since the refuge was established.

Present

The refuge manages the area as grassland, using prescribed fire and grazing. Waterfowl hunting is allowed adjacent to the proposed dove hunt area. Otherwise it is closed to the public. There is currently not oil and gas development in the area, but the minerals are under private ownership.

Future

Since minerals are under private ownership, there is potential of oil and gas development in the future.

The proposed project area is within 40 miles of the Houston Metro Area. There is a high level of urban development throughout the Houston area. The proposed location is in a rural area outside of the Houston area; however the hunt site is adjacent to several landowners, and there are many homes constructed along Farm to Market Road 1985. Implementing this type of program within a rural residential area may increase traffic and road noise near some Chambers County resident's homes. However, impacts are expected to be minimal to private landowners surrounding the Refuge.

4.5.5 Anticipated Impacts If Individual Hunts are Allowed to Accumulate

The Service has concluded that there will be minor cumulative impacts on the Refuge's wildlife populations, either hunted or non-hunted species. The Service has also concluded that the proposed action will not cumulatively impact the Refuge environment or Refuge programs. This determination was based upon a careful analysis of potential environmental impacts of hunting on the Refuge together with other projects and/or actions. Hunting is a compatible wildlife-dependent recreational activity and can be implemented without adversely impacting wildlife populations. Some wildlife disturbance will occur during the limited hunting seasons. Proper zoning, regulations, and Refuge seasons will be designated to minimize any negative impacts to wildlife populations using the Refuge.

4.5.6 Summary of Cumulative Effects

These actions would have both direct and indirect effects (e.g., additional hunting of turkey would result in increased public use, thus increasing vehicular traffic, disturbance, etc); however, these would be minor cumulative effects from the proposed action. When this new hunt is opened, the expected increase in visitation would have beneficial economic impacts on the local community.

National Wildlife Refuges, including Anahuac NWR, conduct hunting programs within the framework of State and Federal regulations. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a regional basis.

Beyond increases in traffic to the local area, the Refuge is not aware of any past, present or 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, and wildlife are expected to be minor and short-term. Any future expansion of the Houston metro-area to the east of the current area could threaten the proposed location in the future without the Service ownership. The benefits to long-term ecosystem health provided by the Refuge will far outweigh any of the short-term adverse impacts discussed in this document.

4.6 Indian Trust Assets:

No Indian Trust Assets have been identified in the Anahuac, Texas vicinity. There are no reservations or ceded lands present. Because resources are not believed to be present, no impacts are anticipated to result from implementation of either alternative described in the EA.

4.7 Unavoidable Adverse Effects:

As proposed under Alternative B, implementation of dove hunting on the Refuge may result in some unavoidable impacts. Some dove would be harvested, however, doves are a renewable resource due to being a R selected species (species with a high productivity potential) and there

would be no negative effect on the general dove population in the local, regional, national, or continental scale. There would also be some short-term disturbance to other resident wildlife, but these impacts are expected to be minimal. Opportunities for public viewing and photography of wildlife on the Refuge would not be impacted.

4.8 Irreversible and Irretrievable Commitment of Resources:

Neither of the alternatives would result in an irretrievable commitment of resources. The Service would reserve the ability to modify the hunt pattern under alternative B to incorporate best management practices.

4.9 Table 1 - Summary of Environmental Consequences by Alternative:

| <u>Environmental Resource</u> | <u>Alternative A:</u> No Action Alternative | <u>Alternative B:</u> Proposed Action Alternative |
|--|--|---|
| Impacts to Air Quality | None | Short-term local negative effects; negligible |
| Impacts to Water Quality and Quantity | None | None |
| Impacts to Soils | None | Short-term local effects related to litter; negligible |
| Impacts on Habitat | None | Short-term local adverse effects; negligible |
| Impacts of Wildlife | None | Short-term local disturbance effects (minor); no long-term effect |
| Impacts on Threatened and Endangered Species | None | None |
| Impacts on Cultural Resources | None | None |
| Impacts on Socioeconomic Resources | None | Short-term beneficial |

5.0 CONSULTATION, COORDINATION AND DOCUMENT PREPARATION

Document prepared by Refuge Staff, Anahuac National Wildlife Refuge, U.S. Fish and Wildlife Service, Anahuac, Texas.

5.1 Agencies and individuals consulted in the preparation of this document include:

The Texas Parks and Wildlife Department (TPWD) supports the regulated consumptive public use of the natural resources associated with the Anahuac National Wildlife Refuge (Refer to Letters of Concurrence). The Fish and Wildlife Service also provided an in-depth review by the Regional Office personnel and staff biologists. Numerous contacts were made throughout the area of the Refuge soliciting comments, views, and ideas into the development of the accompanying hunting plan.

The U.S. Fish & Wildlife Service, Ecological Services Branch reviews project proposals and assures compliance with the Endangered Species Act of 1973. In conjunction with proposed refuge activities, a Section 7 Intra-Service Consultation will be prepared and reviewed to ensure that activities that may affect listed and candidate species are not resulting in adverse impacts to these species.

USFWS Southwest Regional Office: NEPA Coordinator for Refuges and Division of Visitor Services review of Hunt Plan, Environmental Assessment, compatibility determination and other support documents for opening package.

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Appendix A

DEFINITION OF TERMS

Carrying capacity is the maximum population of a particular organism that a given environment can support without detrimental effects.

Effects:

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.

Impact Type:

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

Adverse/negative 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 that 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 Plan and possibly longer.

Intensity of Impact:

Insignificant/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.