

TEXAS CHENIER PLAIN REFUGE COMPLEX

Moody National Wildlife Refuge
Anahuac National Wildlife Refuge
McFaddin National Wildlife Refuge
Texas Point National Wildlife Refuge

***Final Environmental Impact Statement,
Comprehensive Conservation Plan, and
Land Protection Plan
(Volume 2 of 2)***

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Comprehensive Conservation Plans provide long-term guidance for management decisions; set forth goals, objectives, and strategies needed to accomplish refuge purposes; and identify the U.S. Fish and Wildlife Service's best estimate of future needs. These plans detail planning program levels that are sometimes substantially above current budget allocations and, as such, are primarily for USFWS strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

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APPENDIX B: APPLICABLE LAWS

FEDERAL LAWS

Antiquities Act of 1906 (34 Stat. 225). Provides for protection of artifacts and historical objects and their recovery by accredited institutions.

Migratory Bird Treaty Act of 1918, as amended, (16 D.S.C. 703-711; 40 Stat. 755). Implements treaties with Great Britain (for Canada), Mexico, Japan, and Soviet Union for protection of migratory birds whose welfare is a Federal responsibility; provides for regulations to control taking, possessing, selling, transporting, and importing of migratory birds and provides penalties for violations:

Migratory Bird Conservation Act of 1929, as amended, (16 D.S.C. 715-715r; 45 Stat. 1222). Authorizes acquisition, development, and maintenance of migratory bird refuges; cooperation with other agencies in conservation; and investigations and publications on North American Birds.

Migratory Bird Hunting and Conservation Stamp Act of 1934, as amended, (16 D.S.C. 718718h; 48 Stat. 451). Requires that all waterfowl hunters, sixteen (16) years of age or older possess a valid duck stamp; requires use of duck stamp net revenue to acquire migratory bird refuges and waterfowl production areas.

Fish and Wildlife Coordination Act of 1934, as amended, (16 D.S.C. 661-667e; 48 Stat. 401). The Act authorized the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by federal agencies of funds or lands for related purposes provided that land donations received the consent of the State in which they are located.

Refuge Revenue Sharing Act of 1935, as amended, (16 D.S.C. 715s; 92 Stat. 1319). Makes refuge revenue sharing payments applicable to all lands solely or primarily administered by the USFWS. The new law makes payments available for any governmental purpose, whereas the old law restricted the use of payments to roads and schools. For fee (acquired) lands, the new law provides a payment of 75 cents per acre, three-fourths of 1 percent of fair market value, or 25 percent of net receipts, whichever is greater, whereas the old law provided a payment of three-fourths of one percent' adjusted cost or 25 percent of net receipts, whichever was greater. For reserve (public domain) lands, the law provides for a payment of 25 percent of net receipts. The new law authorizes appropriations to make up any shortfall in net receipts to make payments in the full amount for which counties are eligible.

Fish and Wildlife Act of 1956, as amended, (16 V.S.C. 742a-742j; 70 Stat. 1119). Approved August 8, 1956, the Act established a comprehensive fish and wildlife policy and directed the Secretary to provide continuing research, extension and information services; and directed development, management, and conservation of fish and wildlife resources.

Refuge Recreation Act of 1962, as amended, (16 V.S.C. 460k-460k-4; 76 Stat. 653). Authorizes appropriate, incidental, or secondary recreational use on a conservation area administered by the Secretary of the Interior for fish and wildlife purposes.

Wilderness Act of 1964 (16 V.S.C. 1131; 78 Stat. 890). Establishes the wilderness system in the United States. Supplements to the purposes for which units of the National Wildlife Refuge System are established.

Land and Water Conservation Fund Act of 1965, as amended, (16 V.S.C. 4601-11). This Act provides financial assistance to the States for outdoor recreation, primarily in (1) planning; (2) acquisition of land, water, or interests in land or waters; or (3) development. In addition to assistance to the States, the Land and Water Conservation Fund Act provides that not less than 40 percent of the annual appropriation shall be available for Federal purposes. Funds appropriated for Federal purposes shall be made available for

the acquisition of land, waters, or interests in land or waters for the (1) National Park System, (2) National Forest System, (3) National Wildlife Refuge System, and (4) Bureau of Land Management.

The appropriations provided by Land and Water Conservation Fund Act are derived from Outer Continental Shelf leases, tax on motorboat fuels, and sale of certain surplus Federal lands. The Act also increased Land and Water Conservation Fund authorization for FY 1978 and the following years through FY 1989.

The U.S. Fish and Wildlife Service utilizes four basic acquisition authorities which are allowed through the funding authority of Land and Water Conservation Fund Act to purchase land and water, including (1) Endangered Species Act of 1973; (2) Refuge Recreation Act of 1962; (3) Fish and Wildlife Act of 1956, except for migratory waterfowl areas; (4) Emergency Wetlands Resources Act of 1986 and (5) any areas authorized as additions to the National Wildlife Refuge System by specific Congressional Acts.

National Historic Preservation Act of 1966 , as amended, (16 V.S.C. 470, et seq.; 80 Stat. 915). The Act provides for the preservation of significant historical features (buildings, objects, etc.) through a grant-in-aid program to the States and establishes a National Register of Historic Places. Federal Agencies are required to consider the effects of their actions on buildings, etc., included or eligible for inclusion in the National Register.

National Wildlife Refuge System Administration Act of 1966, as amended, (16 U.S.C. 668dd, 668ee; 80 Stat. 927). Consolidates the authorities for the various categories of areas previously established that are administered by the Secretary of the Interior for the conservation of fish and wildlife, including species that are threatened with extinction. All lands, waters, and interests therein administered by the Secretary as wildlife refuges, etc., are hereby designated as the National Wildlife Refuge System. Provides, according to the Act, that the Secretary may authorize hunting and fishing to the extent practicable and consistent with State fish and wildlife laws and regulations.

National Environmental Policy Act of 1969 (NEPA), as amended, (42 V.S.C. 4321, et seq.; 83 Stat. 852). Declares the national policy to encourage a productive and enjoyable harmony between man and his environment. Section 102 of that Act directs that "to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall ". . . insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations. . . "

Section 102 (2)c of the National Environmental Policy Act requires all Federal Agencies, with respect to major Federal actions significantly affecting the quality of the human environment, prepare a detailed statement on:

- The environmental impact of the proposed action
- Any adverse environmental effect which cannot be avoided should the proposal be implemented
- Alternatives to the proposed action
- The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity
- Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Federal Water Pollution Control Act (Clean Water Act) of 1948, as amended, (33 U.S.C. 1251-1376; P.L. 845, June 30, 1948; 62 Stat.1155). The original statute (PL. 845) authorized the Surgeon General, in cooperation with other federal, state and local entities, to prepare comprehensive programs for eliminating or reducing pollution of interstate waters and tributaries by improving the sanitary condition of surface and underground waters. Since 1948, the original statute has been amended extensively either to authorize additional water quality programs, standards and procedures to govern allowable discharges, or funding for construction grants or general program funding.

Endangered Species Act of 1973, as amended, (16 U.S.C. 1531, et seq.; 87 Stat. 884). This Act provides for the conservation of threatened and endangered species of fish, wildlife, and plants by Federal action and by encouraging State programs. Specific provisions include: (1) authorizes the listing and determination of critical habitat of endangered or threatened species and requires consultation with the USFWS on any federally funded or licensed project that could affect any of these species or their habitat; (2) prohibits unauthorized taking, possession, sale, transport, etc. of endangered species; (3) authorizes an expanded program of habitat acquisition; (4) authorizes the establishment of cooperative agreements and grant-in-aid to States, which establish and maintain an active, adequate program for endangered and threatened species; and (5) authorizes the assessment of civil and criminal penalties for violating the Act or regulations.

Archaeological Resources Protection Act of 1979 (16 D.S.C. 470aa-47011; 93 Stat. 721). This Act largely supplanted the resource protection provisions of the Antiquities Act for archaeological items. It established detailed requirements for the issuance of permits for any excavation for or removal of archaeological resources from Federal or Indian lands. It also established civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for trafficking in such resources; and for interstate and foreign commerce in such resources acquired, transported, or received in violation of any State or local law.

Food Security Act (Farm Bill) of 1985, as amended (Title XII, P.L. 99-198; 99 Stat. 1354). The Farm Bill provides nearly 20 agricultural conservation programs, many with potential to affect fish and wildlife habitat. The 1990 and 1996 Farm Bill amendments made the goals of the U.S. Department of Agriculture farm and conservation programs more consistent. The conservation reserve, conservation compliance, sodbuster and swampbuster provisions of the bill encourage reduction of soil erosion, retention of wetlands, protection, enhancement and restoration of wildlife habitat and reduces protection of surplus commodities.

Emergency Wetland Resources Act of 1986. (P.L. 99-645; 100 Stat. 3582) Provides for 1) an extension of Wetlands Loan Act until September 30, 1988; 2) sale of admission permits at certain National Wildlife Refuges; 3) increasing the price of the Migratory Bird Hunting and Conservation Stamp to \$10.00 in hunting years 1987 and 1988, \$12.50 for hunting years 1989 and 1990, and \$15.00 for each hunting year thereafter; 4) transfers import duties collected on arms and ammunition to Migratory Bird Conservation Fund; 5) establishment of National Wetlands Priority Conservation Plan; 6) use of Land and Water Conservation Fund monies for acquisition of wetlands for migratory birds; 7) inclusion of wetlands in statewide outdoor recreation plans; 8) acquisition of wetlands; 9) certain restrictions on use of eminent domain in wetland acquisition; and 10) continuation of National Wetlands Inventory Project.

North American Wetlands Conservation Act of 1989 (16 U.S.C. 4401-4412; 103 Stat. 1968). Encourages partnership among public agencies and other interests to: (1) protect, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife; (2) maintain current or improved distribution of migratory bird populations; and (3) sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan.

Funding provided by the North American Wetlands Conservation Act are derived from Federal Aid in Wildlife Restoration Act (Pittman-Robertson) funds, proceeds from migratory bird fines, penalties, and forfeitures under the Migratory Bird Treaty Act. Appropriations are not to exceed \$20 million for FY 1995 and FY 1996, and \$30 million for Fiscal Year 1997 and 1998. Allocation of funding from the Act provides at least 50 percent, but not more than 70 percent of available funds for projects in Canada and Mexico. At least 30 percent, but not more than 50 percent of available funds will be appropriated for projects in the United States.

National Wildlife Refuge System Improvement Act of 1997, (HR 1420), signed October 9, 1997. The purpose of this Act was to amend the National Wildlife Refuge System Administration Act of 1966 to improve the management and administration of the National Wildlife Refuge System. Its main

components include identifying and unifying the mission for the Refuge System, identifying guidelines for administration of the Refuge System, providing a new process for determining compatible uses of refuges and a requirement for preparation of Comprehensive Management Plans for each unit of the Refuge System within 15 years. The Act also provides guidelines for emergency situations and conflicts with other existing legislation. First and foremost, the Act states that the mission of the Refuge System will be singularly focused on wildlife conservation.

National Wildlife Refuge Regulations for the most recent fiscal year (50 CFR Subchapter C; 43 CFR 3101.3-3). Provides regulations for administration and management of wildlife refuges.

Coastal Zone Management Act of 1972 as amended, (16 V.S.C. 1451-1464, Chapter 33; 86 Stat 1280), established a volunteer national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Funds were authorized for cost-sharing grants to states to develop their programs. Subsequent to federal approval of their plans, grants would be awarded for implementation purposes. Grants are available for coastal management and projects, access improvements, hazard management, planning, growth and development management, and demonstration projects.

The 1972 amendments to the Act established a system of criteria and standards for requiring that federal action be conducted in a manner consistent within the federally approved plan for implementation of the CZMA. The standard for consistency varies depending on whether the federal action involved a permit, license, financial assistance or other federally authorized activity.

Comprehensive Environmental Response, Compensation , and Liability Act of 1980, (CERCLA), (PL 96-510; 42 USC 9601, et seq.) Regulates releases of hazardous materials; provides mechanism for hazardous waste clean-up; and, defines liable parties for hazardous waste clean-up.

EXECUTIVE ORDERS

Executive Order 12372. Review and Coordination of Federally Assisted Programs and Projects.

This Executive Order mandates federal policy governing review and coordination with State and local officials regarding federal government actions affecting their jurisdictions, including the award of federal grants. It was also intended to provide a flexible State administered system of intergovernmental coordination rather than a uniform one directed by the federal government. Under the Executive Order federal agencies are required to: 1) use the State designed consultation procedure to obtain the views of State and local government officials, communicate with these officials as early as possible in the decision-making process, and accommodate the views of State and local officials or explain why those views cannot be accommodated; 2) permit States to simplify or consolidate plans required by federal agencies or substitute plans developed to meet State requirements; and 3) issue and maintain regulations to implement the Executive Order and have the rules approved by the Office of Management and Budget.

Executive Order 11988. Floodplain Management. The purpose of this Executive Order, signed May 24, 1977, is to prevent Federal agencies from contributing to the "adverse impacts associated with the occupancy and modification of floodplains" and the "direct or indirect support of floodplain development." Before proposing, conducting, supporting or allowing an action in a floodplain, each agency is to determine if planned activities will affect the floodplain and evaluate potential effect of the intended actions on its functions. Agencies shall avoid siting a development project in a floodplain "to avoid adverse effects and incompatible development in floodplains," unless all other alternatives have been determined impractical. Federal agencies "shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. "

Executive Order 11990. Protection of Wetlands. The purpose of this Executive Order, signed May 24, 1977, is to direct Federal agencies to do whatever they can to "avoid short and long term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new

construction in wetlands where there are other practical alternatives." In carrying out their respective responsibilities, Federal agencies shall act "to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural benefits of wetlands." This Executive Order only applies to Federal projects.

Executive Order 12996. Management and General Public Use of the National Wildlife Refuge System. In this Executive Order the President of the United States declared that "the mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations." Furthermore, the President identified four guiding principles and issued ten directives to the Secretary of Interior on how the System should be managed in the future. The Executive Order also identified opportunities for compatible wildlife dependent recreation, habitat protection, partnerships and public involvement as guiding principles of the Refuge System. In particular, the President identified "compatible wildlife dependent recreational activities as hunting, fishing, wildlife observation, photography, and environmental education and interpretation as priority public uses of the Refuge System."

Executive Order 13112. Invasive Species. A February 3, 1999 order directing Federal Agencies to prevent the introduction of invasive species, monitor and control populations of invasive species, restore native species in ecosystems that have been invaded, conduct research and develop technologies to prevent introduction and provide for environmentally sound control of invasive species, and promote public education on invasive species.

The order also established the Invasive Species Council and called for a National Invasive Species Management Plan to detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. An order signed January 10, 2001, instructing Federal agencies to conserve migratory birds by several means, including incorporation of strategies and recommendations found in Partners In Flight Bird Conservation Plans, the North American Waterfowl Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.

Executive Order 12898, Environmental Justice, February 11, 1994. Requires Federal agencies to consider the effects of projects and policies on minority and lower income populations.

Executive Order 11593, Protection and Enhancement of the Cultural Environment. States that Federal agencies proposing any development activities that may affect archaeological or historical sites will consult with State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.

APPENDIX C: NON-FISH AND WILDLIFE SERVICE CONSERVATION PROGRAMS AVAILABLE TO PRIVATE LANDOWNERS

Bayou Preservation Association - BPA

Program Description: The Bayou Preservation Association (BPA), a nonprofit organization, was founded in 1966 to prevent the concrete channelization of a segment of Buffalo Bayou. Since that beginning, BPA has expanded its purpose to protect and restore many of the functions of Texas' bayous.

How the Program Works: Lands may be accepted through conveyance of conservation easement or lease, transferring fee title ownership, entering into a management agreement, or registering the property as an example of good land stewardship with a willing landowner.

Regional Use: Statewide

Eligibility: Contact BPA's office for specific eligibility requirements.

Contact: Bayou Preservation Association, P.O. Box 980863, Houston, Texas, 77098, (281) 992-8134

Challenge Cost Share Program - CCSP

Program Description: In 1988, the U.S. Fish and Wildlife Service (USFWS) launched the Challenge Cost Share Program (CCSP) to manage, restore, and enhance fish and wildlife resources and natural habitats on public and private lands. The program is a partnership with non-federal public and private institutions, organizations, and individuals. The CCSP allows the USFWS to provide matching funds for projects that support the management, restoration, and protection of natural resources on more than 500 National Wildlife Refuges, 70 fish hatcheries, research facilities, and on private lands.

How the Program Works: The USFWS provides up to 50 percent of the total project cost, while the partners provide no less than 50 percent of the cost. The partner may contribute cash, material, equipment, land, or water.

Regional Use: Nationwide.

Eligibility: Public and private lands are eligible. Funds provided by the USFWS for projects cannot be matched with other federal funds.

Contact: Challenge Cost Share Program, U.S. Fish and Wildlife Service, Refuges and Wildlife, 500 Gold Avenue, SW, Albuquerque, New Mexico 87103, (505) 248-6824.

Conservation Farm Option - CFO

Program Description: The Conservation Farm Option (CFO) is a pilot program created by Section 335 of the 1996 Farm Bill to foster and test innovation in two arenas-program administration and application of emerging conservation technologies. The goals of the CFO are conservation of soil, water, and related resources, water quality protection and improvement, wetland restoration, protection and creation, wildlife development and protection and other conservation purposes. The Natural Resources Conservation Service (NRCS) will supervise technical aspects of the program, as well as oversight and evaluation, while the Farm Service Agency (FSA) will handle administrative and financial matters. Any other conservation agencies, organizations or consultants may assist in organizing projects, developing conservation plans, contributing matching monies or other resources, and implementing practices.

How the Program Works: The CFO will provide cost-share and annual incentive payments to individual producers who sign 10-year contracts. The annual CFO would replace any other contracts and payments the producer may already be receiving. Individual producers and groups of producers may submit proposals, as well as organized associations or other entities on behalf of producers. CFO will offer continuous sign-up. All proposals will be submitted to the USDA national office for evaluation and selection by an interagency review team. In general, there are no restrictions to the type of proposals that may be submitted, except that they must provide environmental benefits. Proposals will be ranked on a variety of factors, such as project size, rate of participation, type of resource problems, types of conservation practices, innovation, cost effectiveness, partnerships, and monitoring and evaluation plans. Plans that address priority resource problems--including wildlife habitat needs identified and documented by the Local Working Groups (L WG) will receive preference. Producers accepted into the CFO must prepare a detailed Conservation Farm Plan describing all practices and the schedule of implementation. Upon final approval by NRCS, the plan becomes the basis for a CFO contract.

Regional Use: Nationwide

Eligibility: Any wheat, feed grain, cotton or rice farmer who has a production flexibility contract with FSA under the Agricultural Market Transition Act.

Contact: Conservation Farm Option, Natural Resources Conservation Service, 101 S. Main Street, Temple, Texas 76501-7682, (254) 742-9800.

Conservation of Private Grazing Land (CPGL)

Program Description: The CPGL program was created by Section 386 of the 1996 Farm Bill and is the first ever conservation program specifically targeted to private grazing land. The purpose of the program is "to conserve and enhance private grazing land resources and provide related benefits to all citizens of the United States." This program, created in response to the privately sponsored "Grazing Lands Conservation Initiative," will offer landowners the opportunity and assists them to better manage their grazing lands to protect soil, conserve water, provide wildlife habitat and sustain forage production. Conserving and improving wildlife and fish habitat are among several explicit statutory goals.

How the program Works: The CPGL essentially is an educational and technical assistance program administered by the NRCS and modeled on that agency's traditional conservation operations. That is, technical assistance is provided through Conservation Districts (CD) to owners of grazing land on request. Cost-share or incentive payments, contracts and easements are not authorized. Earmarked funds are provided to NRCS to add grazing specialists to strengthen that agency's expertise and outreach capability. Under the Program, Grazing Management Districts (GMD) will be formed to demonstrate and promote scientifically sound grazing practices. A GMD would have an associated technical advisory committee composed of ranchers, farmers and technical experts.

Regional Use: Nationwide.

Eligibility: Any private, state-owned, tribally-owned and any other non-federal rangeland, pastureland, grazed forestland and hayland is eligible.

Contact: Conservation of Private Grazing Land, Natural Resources Conservation Service, 101 S. Main Street, Temple, Texas 76501-7682, (254) 742-9800.

Conservation Reserve Program - CRP

Program Description: The Conservation Reserve Program (CRP) is a large scale cropland retirement program that was created in the 1985 Farm Bill and amended in 1990 and 1996. It was conceived as a dual-purpose commodity supply control and soil erosion reduction program, but has evolved into a multipurpose conservation program. Major goals of the CRP include reducing soil erosion and

sedimentation, improving water quality, maintaining fish and wildlife habitat, and providing support income to the landowner. Under the program, farmers can receive 1) annual rental payments for the land; 2) cost-sharing; and 3) technical assistance to plant vegetation for conservation. The CRP is administered by the FSA in cooperation with the NRCS, Texas Agricultural Extension Service (TABS), State Forestry Agencies, and local soil and water conservation districts.

How the Program Works: Two versions of the CRP are now available to farmers - traditional CRP and continuous signup CRP. Under the traditional CRP, farmers can bid to enroll their highly erodible land or land in a special emphasis watershed in the CRP program during specified sign-up periods at their local FSA office. Under the continuous sign-up CRP, there is a continual application period and automatic acceptance for all eligible applicants. Under both CRP versions, the farmers' bid state the annual rental payments (up to a certain bid cap) that the farmer would be willing to accept for enrolling their lands in the program. For the continuous CRP, FSA can accept rental payments that exceed the rental payment bid cap. Conservation plans describing the conservation and maintenance measures to be carried out by the landowner during the contract term must also be submitted and agreed upon by the landowner and the NRCS District Conservationist.

FSA generally offers contracts under the CRP for 10 to 15 years, but also has the authority to utilize easements in certain situations. Annual rental payments may not exceed \$50,000 per person per year. By law, payments cannot be higher than the local rental rates for comparable land. Rental payments are not counted against payment limitations applicable to commodity price support and production adjustment programs.

In addition to rental payments, CRP provides cost-share incentives. The CRP participants can receive up to 50 percent cost-share from FSA for establishing vegetation. Once the land has been accepted into the Reserve program, the land cannot be farmed during the term of the contract.

Regional Use: Nationwide.

Eligibility: The CRP eligibility is available to any farmer who has lands containing marginal pasture land suitable for a riparian buffer or cropland with recent cropping history that meets specific requirements. Certain lands with an expiring Water Bank Program contracts may also be eligible for CRP. More information on specific cropland requirements under CRP can be obtained from FSA.

Contact: Conservation Reserve Program, Farm Service Agency, P.O. Box 2900, College Station, Texas 77841, (409) 260-9235.

Environmental Quality Incentives Program - EQIP

Program Description: The Environmental Quality Incentives Program (EQIP) is a land management program designed to address a wide array of priority natural resource concerns. EQIP was authorized in the 1996 Farm Bill to replace four smaller, pre-existing agriculture conservation programs - the Agriculture Conservation program, the Water Quality Incentives Program, the Great Plains Conservation Program and the Colorado River Basin Salinity Control Program. Its purposes include conserving and enhancing soil, water, and related natural resources, including grazing land, wetlands and wildlife habitat. Other purposes include maximizing environmental benefits per dollars expended and assisting farmers and ranchers in complying with federal and state environmental laws. Lands covered by the program include cropland, rangeland, pasture, forestland, and other farm and ranch lands.

How the Program Works: To participate in EQIP, farmers and ranchers apply at the local USDA Service Center. Applications are accepted continuously, but only periodically are they ranked and selected by NRCS and approved for funding by FSA. All funded EQIP activities are carried out according to a pre-approved site-specific conservation plan submitted by the participant. The plan is required to address at least one of the priority concerns of the local area. Benefits available to the program participants include cost-share, incentive payments, educational and technical assistance. The benefits that farmers and

ranchers can qualify for vary depending on the land management practices outlined in the conservation plan and the extent of the project.

The NRCS has primary administrative responsibility, but is required to get FSA concurrence for policies, priorities and guidelines. EQIP is implemented by the concept of "locally led conservation," using the L WG convened by Conservation Districts.

Regional Use: Nationwide.

Eligibility: Virtually any farmer or rancher can apply for benefits under EQIP. However, only those persons actively engaged in livestock, or agricultural production are eligible to receive EQIP assistance.

Contact: Environmental Quality Incentives Program, Natural Resources Conservation Service, 101 S. Main Street, Temple, Texas 76501-7682, (254) 742-9800.

Forestry Incentives Program - FIP

Program Description: The Forestry Incentives Program (FIP) was created in 1973 for the purposes of increasing the Nation's supply of timber products from private non-industrial forest lands and conserve and improve the environment. The program may apply to wetlands conservation and restoration of wooded swamps. The FIP provides technical and cost-share assistance to landowners participating in anyone of the four national forestry practices eligible under FIP. These practices include: tree planting, improving a stand of forest trees, site preparation for natural regeneration of trees, and special forestry practices. The FIP is jointly administered by the NRCS and the U.S. Forest Service (USFS) in cooperation with the Texas Forest Service (TFS).

How the Program Works: Landowners apply for participation in the program at the county NRCS office. Upon request from NRCS, the TFS examines the property, develops the Forest Management Plan, and certifies the need for the practice. The TFS will also provide technical advice and help locate approved vendors for accomplishing the work. The TFS must certify that the work has been completed in accordance with the approved plan before payment is made to the landowner by the county NRCS office. Cost-share assistance cannot exceed 65 percent of the actual, average, or estimated cost of performing the practice. The maximum cost-share that a participant can receive annually for forestry practices under FIP is \$10,000. All FIP practices require a minimum 10-year maintenance agreement from the landowner.

Regional Use: Primarily in East Texas Pineywoods. The FIP is offered only in designated counties where a suitable number of ownerships, each capable of producing at least 50 cubic feet of timber per year, exist.

Eligibility: The FIP is limited to landowners of 10 to 1,000 acres. Exceptions to the acreage limitation may be obtained for up to 5,000 acres. Ornamental, Christmas tree production, and orchard tree plantings are not eligible-for FIP funding.

Contact: Forestry Incentives Program, Texas Forest Service, College Station, Texas 77843-2136, (409) 845-2641.

Legacy Land Trust

Program Description: Legacy Land Trust is a non-profit land trust established in 1996 to protect open space, particularly those adjacent to natural bayous, in order to protect water quality and habitat and wildlife values in a 13-county geographic area surrounding Houston.

How the Program Works: Legacy Land Trust works primarily through the development of land preservation agreements, otherwise known as conservation easements, with private landowners.

Regional Use: 13-county area surrounding Houston, Texas.

Eligibility: Contact Legacy Land Trust's office for specific eligibility requirements.

Contact: Legacy Land Trust, P.O. Box 980816, Houston, Texas 77098-0816, (713)-524-2100

North American Wetlands Conservation Act of 1989 - NAWCA.

Program Description: The North American Wetlands Conservation Act (NAWCA), established in 1989, encourages partnerships among public agencies and other interests within the United States, Canada and Mexico to 1) protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, fish, and wildlife in North America; 2) maintain current or improved distribution of migratory bird populations; and 3) sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan and international treaty obligations.

The Act provides funding for wetlands conservation projects involving acquisition, restoration, and enhancement. Funding is approved by the Migratory Bird Conservation Commission (MBCC) based on recommendations from the North American Wetlands Conservation Council (Council). The USFWS coordinates with the Council on NAWCA and can provide assistance to landowners to develop proposals for submission to the Council and MBCC. Funding for the Act is appropriated by Congress and has ranged up to \$15 million a year.

How the Program Works: Proposals may be submitted by any group or individual by April 1 and August 1. Funding becomes available following MBCC approval, which occurs approximately five months following application submission. A proposal must describe how the proposed work fits into a larger project (if applicable); the need for the proposal; where the work is to be done; the affect of the proposal on animals, plants and wetland functions; how much the project will cost; and partner commitments and responsibilities. A grant application instruction booklet outlining the above information in more detail is available through your USFWS Regional Office (see contact below) or the North American Wetlands Conservation Act representative.

The NAWCA grants require a minimum one-to-one grant match from a non-federal source, such as a state, non-profit group, or the landowner, or a combination of these. Proposals with higher match ratios are preferred. Annual payments for leases or easements require a minimum 10-year agreement and demonstration projects require a minimum 5-year agreement.

Regional Use: Nationwide

Eligibility: Projects involving acquisition, restoration, enhancement, creation, management, and other activities that conserve wetland ecosystems and the fish and wildlife that depend on such habitats are eligible for the Act or matching partner funds. Areas of special concern and larger areas are usually given priority in grant consideration.

Contact: North American Wetlands Conservation Act, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, NM 87103-1306, (505) 248-6876; Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, (512) 389-4578.

North American Waterfowl Management Plan Joint Venture Projects--NAWMP

Program Description: The North American Waterfowl Management Plan (NAWMP) was signed in 1986 between the United States and Canada to protect, restore, and enhance wetlands important to waterfowl and other wetland-dependent bird species. Mexico has recently signed the NA WMP as well. The NAWMP's primary objective is to return waterfowl populations to levels observed in the 1970s, when fall flights exceeded 80 million ducks. The plan is implemented at the grassroots level by partnerships called

Joint Ventures. Wetlands identified under NAWMP as "areas of major concern" for waterfowl habitat (e.g., migration, nesting and forage areas) are targets for these joint ventures.

How the Program Works: Joint Venture Management Boards, consisting of federal, state, and private agencies and private individuals, have been established to coordinate work within the Joint Venture areas. Because most lands in Texas are privately owned, landowner involvement is crucial for the joint ventures to succeed. Private landowners of wetlands significant to waterfowl may receive technical and financial assistance through a variety of cooperative programs within their geographic area. Participation is not exclusive to individual landowners, however. Corporations such as Phillips Petroleum, Exxon, DuPont, and Central Power and Light in Corpus Christi have all become involved in wetland conservation projects on their land and/or participate in various joint venture projects.

The Plan also supports research on wetlands restoration, wetlands status surveys, and wetlands inventories.

Regional Use: There are currently eleven habitat joint ventures underway in the United States. Principal areas targeted by the plan are the Atlantic Coast from Maine to Florida; the Lower Mississippi River region; the Upper Mississippi River-Great Lakes region; the Gulf Coast; the Playa Lakes region of Texas, New Mexico, Oklahoma, Kansas, and Colorado; California's Central Valley; the Pacific Coast; the Rainwater Basin; the Prairie Pothole region of Minnesota, North Dakota, South Dakota, and Iowa; the Intermountain West; and San Francisco Bay.

Eligibility: Any landowner (federal, state, group, or individual) with property of significance to waterfowl and other wetland-dependent species who wishes to restore or enhance the land may apply through the specific Joint Venture Management Board. Both financial and technical assistance may be available.

In Texas, three joint ventures exist: The Gulf Coast Joint Venture (GCN), the Playa Lakes Joint Venture (PLN), and the Lower Mississippi River Valley Joint Venture (LMVN). The Prairie Wetlands Project (PWP) has been created as part of the GCN. These programs are summarized below.

Contact: North American Waterfowl Management Plan, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103-1306, (505) 248-6634; Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, (512) 389-4578.

Natural Resources Conservation Service Technical Assistance - NRCS (TA)

Program Description: The Natural Resources Conservation Service is the technical arm of USDA. Technical assistance and information is available for: 1) wetlands determinations for wetland protection and management programs; 2) developing conservation plans for protecting and managing wetlands; 3) providing income-producing alternatives for use and management of wetlands; 4) developing standards and specifications and designing and installing conservation measures for wetland restoration, creation, and enhancement; 5) providing information on plant materials for wetland planting; providing soil surveys and information for identifying, planning, and managing wetlands.

How the Program Works: Landowners request technical assistance through local soil and water conservation districts. Technical assistance and information is provided according to local priorities and available resources.

Regional Use: Nationwide. Also include territories of the United States.

Eligibility: Landowners who sign agreements with local soil and water conservation districts can receive technical services for managing, using, enhancing, creating, and restoring wetlands.

Contact: Natural Resources Conservation Service Field Offices located in many locations in Texas. Look in the phone directory under U.S. Government or call NRCS State Headquarters in Temple, Texas at (254) 742-9800.

Partners for Fish and Wildlife Program (PFWP)

Program Description: The Partners for Fish and Wildlife Program (PFWP), also known as the Private Lands Assistance and Restoration Program, offers technical and cost-share assistance to landowners who wish to restore wildlife habitat, including degraded or converted wetlands and those upland habitats that meet specific eligibility criteria. The objectives of PFWP programs are to restore, enhance, and manage wetlands for fish and wildlife habitat; promote profitable land use for agricultural, industry, and private landowners; and promote a wise and lasting landuse ethic.

The program focuses on reestablishment of original natural communities. Special consideration is given to projects that: (a) contribute to the survival of endangered, threatened, or candidate species, or migratory birds of management concern; (b) contribute to meeting the goals of the North American Waterfowl Management Plan; (c) are located very close to existing habitat so that fragmentation of habitats would be reduced and recolonization by a full component of native plants and animals could easily occur; (d) contribute to the restoration of globally or nationally imperiled natural communities; (e) will result in a self-sustaining system that is not dependent on artificial structures (although projects using levees, dikes, and diversion terraces with water-level control devices, for example, are frequently funded; (f) will use native self-propagating species; or (g) provide education/outreach opportunities.

How the Program Works: The U.S. Fish and Wildlife Service may provide assistance to landowners ranging from giving informal advice on a design and location of a potential restoration project, to designing and funding restoration projects under a formal cooperative agreement with the landowner. Restoration efforts may include, but are not limited to, plugging drainage ditches, installation of water control structures, fencing riparian areas to exclude livestock, and restoring native vegetation. The landowner contacts the USFWS and an onsite visit is arranged to discuss landowner's needs and ideas for the property. If cost shared assistance is requested, the landowner and USFWS staff work together to prepare a Habitat Restoration Proposal for the project, which is submitted to the USFWS. Generally, cooperative agreements that are longer in duration are preferable to those of shorter duration. Cooperative agreements may not be less than 10 years. Cost-shared assistance is available up to 100 percent; however, funding is more probable with some cost-shared assistance. Demonstration projects may be less than 10 years in duration. Project terms less than 10 years may be cost-shared up to 50 percent and may not exceed \$5,000. Demonstration projects greater than 10 years may have a greater cost share and higher total costs.

Regional Use: Nationwide.

Eligibility: Subject to priority and preference factors stated above, any wetland is eligible for restoration with technical and financial assistance by the USFWS. Upland habitats are eligible for financial assistance only if their restoration will contribute to certain program goals. Once the agreement period has expired, the landowner is not obligated to follow the Cooperative Agreement guidelines. Agricultural practices with conservation purposes are allowed on restoration sites.

Contact: Partners for Fish and Wildlife Program, U.S. Fish and Wildlife Service, 17629 El Camino Real, Suite # 211, Houston, Texas 77058 (281) 286-8282.

Program Description: The Texas Parks and Wildlife Department (TPWD) provides technical assistance to persons desiring to include wildlife management considerations in present and future land use practices. This service is strictly advisory and is provided without charge to cooperating landowners. The goal of the Private Lands Enhancement Program (PLEP) is to provide expertise to land managers in the conservation and development of wildlife habitat and the various wildlife populations that utilize that habitat.

How the Program Works: Upon the landowners' written request, the TPWD biologist schedules a personal meeting and a property inspection with the landowner. The landowner defines the various needs and uses of the property and establishes objectives for wildlife conservation. The biologist then

recommends actions to achieve the landowner's objectives. A written management plan may be developed upon request. Components of the plan may include objectives, past history, and an explanation of proper harvest and surveying techniques. Wildlife biologists will continue to assist landowners through periodic visits to help interpret survey information and formulate harvest recommendations.

Regional Use: Statewide.

Eligibility: Landowners interested in conserving and managing wildlife habitats on their property are eligible.

Contact: Private Lands Enhancement Program, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, (512) 389-4395.

Private Lands Initiative - PLI

Program Description: The Texas Private Lands Initiative (PLI) is a voluntary program in which landowners work with TPWD and the National Fish and Wildlife Foundation (NFWF) to enhance wildlife habitat through partnerships. The PLI applies to a variety of landscapes in Texas, including wetlands such as bottomland hardwoods, playa lakes, and riparian areas. The TPWD had identified 16 types of projects to enhance habitat on private lands. In wetland areas, these projects may include moist-soil management, fencing, planting, and pumping agreements. These projects offer landowners a unique opportunity to use their wetlands as demonstration sites for future projects.

How the Program Works: Projects under the PLI are cost-shared by the landowner and NFWF, while TPWD offers technical assistance and program coordination. Funding is dependent on availability of grants.

Regional Use: Statewide.

Eligibility: Wetland projects must be a minimum 10 year (negotiable) commitment and the landowner is obligated to maintain the improvements include planting a diverse mixture of legumes and grass surrounded by a 4-strand barbed wire fence in playa lakes. Assistance is available on other improvements as well. No cost-sharing is available to reverse damage in playa basins caused by livestock grazing, such as soil erosion and runoff.

Contact: Private Lands Initiative, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, (512) 389-4395.

Stewardship Incentive Program – SIP and Forest Stewardship Program - FSP

Program Description: Both programs involve the development of a Forest Stewardship Plan designed to accommodate the needs of both the landowner and the natural resources on the property. The Forest Stewardship Program (FSP) provides technical assistance to help landowners enhance and protect the timber, fish and wildlife habitat, water quality, wetlands, and recreational and aesthetic values of their property. The Stewardship Incentive Program (SIP) provides cost share assistance to private landowners for implementing the stewardship plans developed under the FSP. Upon approval of the plan, cost-shared assistance is provided through SIP. The guidelines for SIP define eight major categories for funding: Management Plan Development, Reforestation and Afforestation, Forest and Agroforest Improvement, Windbreak and Hedgerow Establishment, Riparian and Wetlands Protection and Improvement, Fisheries Habitat Enhancement, Wildlife Enhancement, and Forest Recreation Enhancement.

Both FSP and SIP are administered by the TFS in cooperation with the USFS. The Farm Service Agency (FSA) provides administrative assistance.

How the Program Works: The USFS staff or certified consultants work with private landowners to develop a multi-use Forest Stewardship Plan that details the project's activities to protect and enhance forest resources. Existing management plans can be modified to meet Forest Stewardship Plan guidelines. Once a forest management plan has been developed and approved, up to 75 percent cost-share is provided through SIP to fund the plan's projects. Payments may not exceed \$10,000 per landowner per fiscal year. To receive financial assistance, landowners must agree to manage the land according to the plan for at least ten years. Significant accomplishments are recognized by designating the landowner Forest Steward, which gives public recognition to the landowner.

Regional Use: Nationwide. Available statewide in Texas for wetlands.

Eligibility: Eligible landowners must have an approved Forest Stewardship Plan. Landowners owning between 10 and 1,000 acres of forest land who do not derive most of their income from timber manufacturing on the property are eligible. Authorizations may be obtained of up to 5,000 acres. Forest land is defined as rural land with at least 16 percent canopy cover or other land capable of supporting at least 10 cubic feet of wood per acre per year under natural conditions. Christmas tree, orchard, or ornamental plantations are ineligible.

Contact: Stewardship Incentive Program - Forest Stewardship Program, Texas Forest Service, College Station, Texas 77843-2136, (409) 845-2641.

Texas Prairie Wetlands Project - TPWP

Program Description: The Texas Prairie Wetlands Project (TPWP), designed to accomplish the goals and objectives of the Gulf Coast Joint Venture (GCJV), is a partnership effort to restore, create, or enhance wetlands beneficial for waterfowl and other wildlife use. The TPWP projects include management of water on cropped lands, restoration of converted wetlands, enhancement of natural wetlands, or creation of wetlands on non-wetland sites.

How the Program Works: Landowners interested in creating and maintaining habitat for waterfowl or other wildlife on their property for a prescribed period are offered financial and technical assistance through the Texas Prairie Wetlands Project office. The landowner may also contact the Service, NRCS, TPWD, and Ducks Unlimited (DU), who will coordinate with the PWP office. Cost-shared assistance of up to 75 percent is available (100 percent where supplemental water is provided by the landowner), but average costs to PWP must not exceed \$200 per acre. In return, the landowner and PWP agree on management practices in the Wetland Development Agreement (WDA). The WDA is a management plan designed to satisfy the landowner as well as provide sufficient habitat for waterfowl and other migratory birds. Technical assistance for creating, restoring, and maintaining habitat is provided through both on-site and county workshops. The PWP allows for normal rotations in agriculture.

Regional Use: Twenty-eight coastal counties in Texas.

Eligibility: Private landowners and farm operators (landowners must co-sign agreements) within the 28 county project area are eligible. A landowner is limited to one cost-shared wetland agreement per calendar year.

Contact: Texas Prairie Wetlands Project, Prairie Wetlands Project Office, 312 S. Main Street, Room 310, Victoria, Texas 77901, (512) 576-0282; 2205 Avenue I #114, Rosenberg, Texas, (281) 341- 7968.

Voluntary Debt-for-Nature Contracts - VDFNC

Program Description: The FSA allows for borrowers to enter into Conservation Contracts (CC) in exchange for reducing the amount of agricultural loans that must be repaid to the government.

How the Program Works: The CC may be for a period of 10, 30 or 50 years. The amount of debt canceled is proportionate to the length of protection. Borrowers who agree to a 50-year CC will receive the maximum amount of debt to be written down. Borrowers who agree to a 30- or 10-year contract will receive 60 and 20 percent of the maximum write down, respectively.

The authority for a CC applies to private land that is 1) used as security for existing or new USDA Farm Program Loans, and 2) suitable for conservation, recreation and wildlife habitat purposes. The suitability of the land offered for a CC is determined by an interagency Contract Review Team composed of representatives of FSA, the NRCS and the USFWS, along with any other conservation agency or organization that accepts an invitation to participate. Eligible lands include wetlands, wildlife habitat of local, regional or national importance, upland and highly erodible land. The CC require that no agricultural production takes place on the subject land for the duration of the contract. The Contract Review Team also develops a Management Plan to include any special conditions needed in the contract.

Regional Use: Nationwide.

Eligibility: Every borrower with U.S. Department of Agriculture (USDA) loans secured by real estate is potentially eligible, whether the borrower is delinquent or current in making payments, or is simply applying for a new loan.

Contact: Voluntary Debt-for-Nature Contracts, Farm Service Agency, P.O. Box 2900, College Station, Texas 77841, (409) 260-9235.

Wetland Habitat Alliance of Texas – WHAT

Program Description: The Wetland Habitat Alliance of Texas (WHAT) is an organization dedicated to preserving Texas wetlands by raising public awareness and appreciation of wetlands and funding" projects to protect, enhance, and restore natural wetlands. WHAT also provides youth and adult education and serves as a liaison to the government, conservation organizations, hunters, and the general public.

How the Program Works: WHAT solicits funds for projects such as management of water on cropped wetlands, restoration of converted wetlands, enhancement of natural wetlands, and creation of wetlands on non-wetland sites. Interested landowners can receive up to 100 percent financial assistance in return for a minimum 10-year agreement.

The cooperator maintains ownership of the land upon completion of the project. The cooperator and WHAT agree to any proposed development on the land before an agreement is sealed. The NRCS will verify the operable conditions; WHAT will pay costs and provide technical assistance to cooperators within the specifications of the agreement. WHAT is interested in working with landowners to find an agreement acceptable to all parties involved.

Regional Use: Statewide.

Eligibility: Any landowner interested in accomplishing the same goals as WHAT is eligible to participate.

Contact: Wetland Habitat Alliance of Texas (WHAT), 118 E. Hospital, Suite 208, Nacogdoches, Texas 75961, (409) 569-9428.

Wetlands Reserve Program - WRP

Program Description: The Wetlands Reserve Program (WRP) was authorized by the 1990 Farm Bill. The WRP is a voluntary land retirement program exclusively applicable to wetlands offering landowners a chance to receive payments for restoring or protecting wetlands on their property. The WRP provides a unique opportunity for farmers to retire marginal agricultural lands and reap the many benefits of having

wetlands on their property. Under WRP, the NRCS staff work with participating landowners to secure conservation easements and provide cost-sharing assistance for wetlands restoration.

How the Program Works: Three WRP protection options are available to landowners under the WRP: permanent easements, 30-year easements, and restoration cost share agreements of a 10-year minimum duration. The level of federal protection depends on the duration of protection. The permanent easement option generally is 100 percent of the agricultural value or established area cap and USDA pays 100 percent of the restoration costs. The 30-year easement option pays 75 percent of the agricultural value or established area cap and USDA pays 75 percent of the restoration costs. With the restoration cost-share agreement there is no incentive payments. While the law allows for the purchase of either permanent or 30-year easements, priority will be given to permanent easements. Landowners will be responsible for taxes on easement lands. However, taxes will likely be minimal as the land will not be used for crop production. The landowner maintains ownership of the land and maintains the easement. Public access is not allowed unless desired by the landowner.

Farmers interested in participating in the WRP should apply to the program through their county Natural Resources Conservation Service office at any time. The NRCS and the U.S. Fish and Wildlife Service will determine eligibility of the acres offered, by ranking them according to: 1) duration of the easement offer, 2) hydrology restoration potential, 3) habitat value for migratory birds and other wildlife, 4) wetland functions and values, 5) location significance, 6) wetland management requirements, 7) physical site condition, and 8) over-all cost. Applications with the most environmental benefits and least costs will be selected.

A restoration plan will be developed for the area. The landowner is given detailed information on what the restoration will be and how much funding will be provided, then makes a decision to enter the program or end further consideration.

Total easement payments for permanent easements may not exceed \$550 per acre or appraised agricultural value, whichever is less. For 30-year easements, the landowner can receive up to 75 percent or appraised agricultural value not to exceed \$412.50 per acre.

Regional Use: Nationwide.

Eligibility: Lands eligible for WRP include restorable wetland areas that have been used intensively for cropping and forage production. For a forage production area to be eligible, the natural wetland vegetation must have been removed, mainly through management practices. Adjacent land deemed necessary to protect the restored wetland also will be included. The WRP lands must contain a substantial amount of restorable wetland. Limited areas of natural wetland, plus non-wetland areas needed to buffer the wetland from disturbance or to establish reasonable field boundaries, may be included.

Wetlands enrolled in the CRP may be eligible to transfer over into the WRP program. CRP land enrolled prior to November 28, 1990 or CRP land likely to return to production after the CRP contract expires are examples of CRP land eligible to transfer into the WRP.

Contact: Wetlands Reserve Program, Natural Resources Conservation Service, 101 S. Main Street, Temple, Texas 76501-7682, (254) 742-9800.

Wildlife Habitat Incentives Program - WHIP

Program Description: Wildlife Habitat Incentives Program (WHIP), was created by section 387 of the 1996 Farm Bill, is a land management program that helps private landowners plan and pay for wildlife habitat improvements. Specifically it will help landowners to develop upland wildlife, wetland wildlife, threatened and endangered species, fish, and other types of wildlife. The program is administered by the NRCS, but is developed in conjunction with State Technical Committees, as well as other federal and state agencies and conservation partners.

How the Program Works: WHIP provides technical and cost share assistance, but contrary to its name, incentive payments cannot be made under the current law. WHIP is funded through monies from the CRP up to a total of \$50 million through the year 2002. The program will provide up to 75 percent of the cost of installing and maintaining practices. The remaining 25 percent of the cost may be paid by the landowner or any other nonfederal conservation partners. Additional incentives, above the cost of installation, may be provided by conservation partners to enhance participation. To participate in the program, landowners must submit an application during an announced sign-up period. Wildlife Habitat Develop Plans (WHDP) are then developed by NRCS to address wildlife goals, the habitat practices for meeting them, as well as installation and maintenance practices. Following the sign-up period, the WHDP's are ranked by the NRCS State Conservationist.

Regional Use: Nationwide.

Eligibility: Most privately-owned land is eligible under the program, provided this land is not enrolled in other federal programs and does not have a restrictive easement. Lands need not be in agriculture to be eligible.

Contact: Wildlife Habitat Incentives Program, Natural Resources Conservation Service, 101 South Main, Temple, Texas 76501-7682, (254) 742-9800.

Coastal Zone Management Administration Implementation Awards Program – CZMA/IAP

Program Description: Assists states in implementing and enhancing Coastal Zone Management Programs. Grants available for coastal management and protection, access improvements, hazard management, planning, growth and development management, and demonstration projects.

How the Program Works: Formula grants are provided to the states for approval projects through the National Oceanic and Atmospheric Administration. Grants can be used for the activities outlined in the above program description. In some states coastal coordination councils have been established to provide program oversight and project review and approval.

Regional Use: Nationwide.

Eligibility: All coastal states including the Great Lake States, Puerto Rico, Virgin Islands, Guam, American Samoa, the trust territories of the Pacific and the Commonwealth of the Northern Mariana Islands.

Contacts: National Oceanic Atmospheric Administration, Department of Commerce, National Ocean Service Office of Ocean Resources Conservation and Assessment, 1309 E-W Highway, Silver Spring, Maryland 20910, (301) 713-315.5 extension 195; Texas Coastal Coordination Council, 1700 Congress Avenue, Austin, Texas 78711-1495, (512) 463-5385.

APPENDIX D: COMPREHENSIVE CONSERVATION PLAN (CCP) WITH GOALS, OBJECTIVES, AND STRATEGIES

Management Focus

Under this Comprehensive Conservation Plan, the Refuge Complex will continue and expand current habitat management and native habitat restoration programs, with increased monitoring and research to assess management actions and facilitate a more effective adaptive management approach. Wetland habitat management activities for waterfowl, shorebirds and other wetland-dependent migratory birds including structural water management in marshes, prescribed burning, controlled grazing, and rice farming and moist soil management will be refined and enhanced, and in some cases expanded through development of new infrastructure. Concurrently, additional restoration of native habitats including wetlands, prairie and woodlots will be undertaken to benefit a variety of native fauna, with a focus on priority species identified as in need of conservation through national and international conservation initiatives.

Expanded efforts will be undertaken to address major ecosystem threats from sea level rise and land subsidence, altered hydrological systems and reduced sediment supply, exotic and invasives species and environmental contaminants. Efforts to reduce coastal habitat loss and degradation resulting from shoreline erosion along the Gulf, Galveston Bay and the GIWW and to restore emergent marshes will be intensified by increasing coordination among agencies and other stakeholders. Goals include implementing large-scale partnership projects including barrier beach/dune restoration on McFaddin NWR, marsh and shoreline restoration on Texas Point NWR through the beneficial use of dredge material, and structural shoreline protection along the GIWW and East Galveston Bay. Ongoing interior marsh loss will be addressed by working with agencies and other stakeholders on watershed-scale hydrologic restoration projects that restore freshwater inflows and further restrict saltwater intrusion and increased beneficial use of dredge material to restore mineral sediment supply to marshes. The USFWS will also implement several smaller hydrologic restoration and shoreline protection projects on the Refuge Complex. Control and monitoring programs for exotic and invasive species will be intensified, and additional efforts to monitor and reduce impacts of contaminants implemented.

Through new partnerships with universities and other agencies, additional research and monitoring will be conducted to better assess impacts of relative sea level rise and to support future conservation planning to address these impacts. Additional monitoring of exotic/invasive plant species, including research to assess the efficacy of ongoing and new control techniques, will be conducted. Additional research on effects of environmental contaminants on fish and wildlife will be conducted. Additional baseline data on fish and wildlife populations and habitat use will be collected, with an emphasis on documenting the status of several sensitive or declining species.

USFWS habitat management and restoration and biological program activities on the Refuge Complex will support conservation objectives and informational needs for priority species identified in regional, national and international avian conservation plans. These include plans for waterfowl and avian conservation under the North American Waterfowl Management Plan (the Gulf Coast Joint Venture's Chenier Plain Initiative Plan, Mottled Duck Conservation Plan and all-bird conservation initiative), the U.S. Shorebird Conservation Plan and step-down Lower Mississippi/Western Gulf Coast Regional Shorebird Plan, the North American Waterbird Conservation Plan, and the Partners in Flight Regional Conservation Plan for the Gulf Prairies Bird Conservation Region (BCR 37) (currently in preparation).

The Refuge Complex will continue to provide and promote opportunities for all six of the National Wildlife Refuge System's priority wildlife-dependent recreational uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. The Refuge Complex will seek to provide additional recreational opportunities and improve the quality of visitor services and of the visitor experience through construction of additional public use facilities including a Refuge Complex Administrative Headquarters and Wildlife Interpretive Center in Chambers County, expanding law

enforcement efforts to protect public safety and natural resources, providing additional hunting and fishing opportunities, and developing additional educational and interpretive programs. Expanded outreach to local communities and private landowners will be aimed at developing new partnerships to further conservation and promote awareness of the region's natural resources.

Subject to available funding, staffing on the Refuge Complex will be expanded by seven positions during the 15-year planning horizon the CCP. This includes six positions previously established by the USFWS as Essential Staffing on the Refuge Complex: 1) Wildlife Biologist; 2) Plant Ecologist; 3) Geographic Information Systems - Computer Specialist; 4) Natural Resource Specialist - Oil and Gas Management; 5) Refuge Operations Specialist; and 6) Heavy Equipment Operator. In addition, one Refuge Law Enforcement Officer position will be established to increase protection of refuge resources and public safety.

Rationale for this Management Focus: The coastal marshes, prairies and woodlots of the Chenier Plain region of southwestern Louisiana and southeast Texas comprise a hemispherically important biological area. The Texas Gulf Coast is the primary site for ducks wintering in the Central Flyway, with an average of 1.3-4.5 million birds, or 30-71% of the total flyway population (Stutzenbaker and Weller 1989). This area also winters 90% of the snow, Canada, and greater white-fronted geese in the Central Flyway (Buller 1964). Additionally, the coastal marshes, prairies and prairie wetlands of the Chenier Plain region of the Texas Gulf Coast serve as a critical staging area for Central Flyway waterfowl migrating to and from Mexico and Central and South America. Hundreds of thousands shorebirds, wading birds, and other marsh and waterbirds also winter or migrate through the region, including several now identified by the USFWS as avian Species of Conservation Concern. Coastal prairie and coastal woodlots support over 150 migratory and resident land bird species, including 9 species of grassland birds and 7 species utilizing woodland habitats listed as Rare and Declining within the Coastal Prairies Region of Texas (Shackelford and Lockwood 2000). Overall, wetland, prairie and woodland habitats on the Refuge Complex provide habitat for 33 Avian Species of Conservation Concern in the Gulf Prairies Bird Conservation Region (BCR 37) (USFWS 2005).

The high degree of alteration in this ecosystem has resulted in loss and degradation of native habitats, loss of biological diversity, and decreased habitat quality for migratory birds and other native wildlife. Alterations of historic hydrology including loss of freshwater inflows and increased saltwater intrusion, coastal erosion, land subsidence and sea level rise are contributing to ongoing coastal land loss and marsh degradation. Almost all of the region's historic native tall grass coastal prairie and its associated prairie wetlands have disappeared, and remaining coastal woodlots are imminently threatened by development and other land use changes. Several highly invasive exotic plant species are replacing native habitats and severely impacting native biological diversity. Air and water quality issues in the region pose a potential contaminant threat to fish and wildlife, as do accidental spills and discharges from the major petrochemical shipping, storage and processing facilities located in close proximity to sensitive Refuge Complex habitats. Habitat losses to date and ongoing threats in this ecosystem are such that intensive management of remaining habitats, in combination with habitat restoration where feasible, is required to conserve fish and wildlife resources.

The Refuge Complex provides over 172,000 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. Southeast Texas has a long and rich tradition of outdoor recreation. Demand for these recreational opportunities on public lands and water is increasing. The human population in the 8-county area surrounding Houston now exceeds 6 million people. The Texas Gulf Coast has become a popular destination for national and international nature tourists. Improving visitor services and the quality of the visitor experience on these refuges is a critical component of future management.

GOAL 1. Conserve, enhance, and restore the Texas Chenier Plain region’s coastal wetlands to provide wintering, migrational, and nesting/brood-rearing habitat for waterfowl, shorebirds, marshbirds, wading birds, and other wetland-dependent migratory birds and habitat for native fish and wildlife.

Note: The following RONS Projects are Essential Staffing Positions which support coastal wetlands restoration, enhancement and management strategies:

Anahuac NWR RONS Project #98004 - Essential Staffing - GIS Computer Specialist
Anahuac NWR RONS Project #98034 - Essential Staffing - Plant Ecologist
Anahuac NWR RONS Project #97058 - Essential Staffing - Wildlife Biologist
Anahuac NWR RONS Project #00007 - Essential Staffing - Refuge Operations Specialist
Texas Point NWR RONS Project #00001 - Essential Staffing - Heavy Equipment Operator

Objective A. Coastal Marshes - Emergent Wetlands (Estuarine and Palustrine Wetlands).

On an annual basis, manage and maintain 30 to 40% of fresh and intermediate emergent coastal marshes on the Refuge Complex in target plant communities which contain several early and mid-successional emergent plant species.

Rationale for Objective

Meeting the habitat needs of the region’s diversity of wetland dependent resident and migratory birds requires maintaining a range of coastal marsh habitat types and plant community successional stages within these marsh types. Providing freshwater inflows and restricting saltwater intrusion are critical to maintaining the Chenier Plain’s historic continuum of fresh, intermediate, brackish saline marshes. Habitat values for waterfowl, shorebirds and many wading bird species are greatly enhanced in intermediate marshes with early successional plant communities containing several perennial and annual plant species (primarily grasses and sedges) which provide important food resources, and where disturbance reduces the height and/or density of vegetation. Perennial emergent plants important to wintering waterfowl include seashore paspalum (*Paspalum vaginatum*) and Olney bulrush (*Scirpus olneyi*). Early successional emergent plant species important to waterfowl include annual grasses such as millet (*Echinochloa* spp.) and sprangle-top (*Leptichloa fascicularis*) and forbs such as water hyssop (*Bacopa monnieri*) and purple ammania (*Ammania coccinea*). Migratory bird species such as rails require denser vegetation and plant species composition typical of later successional stages (Fredrickson and Taylor 1982). Coastal marshes have evolved with disturbance regime which includes fire, herbivory by native wildlife, and infusion of saline waters during tidal surges associated with tropical storms. Natural fire and herbivory by native species now occur less frequently or at reduced levels due to human influences on the ecosystem (Stutzenbaker and Weller 1989). Water level and salinity management, prescribed burning and controlled grazing are available tools for influencing plant communities (species composition and physical structure) in marsh habitats.

Strategies

Throughout the Life of the Plan and Refuge Complex-wide:

- **Strategy 1** - Actively manage water levels and salinities in managed marsh units (approximately 30,000 acres of semi-impoundments and impoundments) utilizing water control structures, levees and water delivery and drainage infrastructure to maintain a continuum of brackish to fresh conditions and desirable marsh hydroperiods (wetting and drying cycles). On Texas Point NWR, utilize passive water management with rock weirs to reduce saltwater intrusion and restore hydrology.

- **Strategy 2** - Conduct a rotational prescribed burning program in marsh units on the Refuge Complex with an annual burning objective of 12,000 to 15,000 acres, burning from late September to late-November (to the extent permitted by environmental/climatic conditions and air quality parameters) to maximize the benefits of integrated burning/grazing/water management programs.
- **Strategy 3** - Initiate limited summer prescribed burning to control invasive woody vegetation including Baccharis (*Baccharis halimifolia*) and big-leaf sumpweed (*Iva frutescens*) in portions of targeted marsh management units.
- **Strategy 4** - Initiate and conduct short and long-term ecological fire effects monitoring and use results to guide an adaptive approach to implementing the prescribed burning program.
- **Strategy 5** - Conduct a rotational cool season grazing program on approximately 41,000 acres of marsh habitats on the Refuge Complex.
- **Strategy 6** - Modify controlled grazing program during the initial period of the CCP's implementation by increasing (given favorable forage and water conditions) grazing intensity in several marsh units on the Anahuac, McFaddin and Texas Point NWRs.
- **Strategy 7** - Reconfigure grazing units through additional fencing and development of additional watering sites to increase the effectiveness and efficiency of the control grazing program. (Anahuac NWR RONS Project #99055 - Enhance grazing program, McFaddin NWR RONS Project #00006 - Enhance grazing program)
- **Strategy 8** - Develop a step-down Nuisance Animal Management Plan to protect emergent marshes from excessive herbivory by nutria (an exotic species) and by high populations of muskrats. Under this plan, manage muskrat and nutria populations utilizing trapping under Special Use Permits when necessary to prevent damage to emergent marsh habitats.
- **Strategy 9** - Increase herbivory by native wildlife by developing new grit sites and maintaining sanctuary areas for geese through the special white goose conservation season (in effect since 1999) which follows the regular waterfowl hunting season.
- **Strategy 10** - Facilitate and support ongoing and new research studies to determine fire effects on marsh accretion, soils, vegetation, and wildlife (Anahuac NWR RONS Project# 97021- Monitor marsh elevation change, McFaddin NWR RONS Project #00013 - Conduct fire effects study)
- **Strategy 11** - Monitor conservation easements on Moody and McFaddin NWRs.

Objective B. Open Water Wetlands (Estuarine and Palustrine Wetlands). Increase species diversity and production of submerged aquatic vegetation in marsh habitats and increase open water habitat by 10% in fresh and intermediate marshes on the Refuge Complex.

Rationale for Objective

Open water wetlands that contain submerged aquatic vegetation provide valuable habitat for resident and migratory waterfowl and numerous other waterbirds. The submerged aquatic plant community serves as a direct source of important waterfowl foods (e.g., seeds and tubers), and indirectly, as a rich environment for aquatic macroinvertebrates, which are heavily utilized by waterfowl and many other wetland birds (Baldassarre and Bolen 1994). These habitats are extremely important for brood-rearing and molting Mottled Ducks (Stutzenbaker 1988). Open water habitats supporting submerged aquatic vegetation within estuarine marshes also provide vital nursery habitat for many species of marine fish and shellfish (Stutzenbaker and Weller 1989).

Hydrological alterations through activities such as channelization and restriction of freshwater inflows have resulted in saltwater intrusion, accelerated dewatering and drying, and/or excessive and prolonged flooding in the region's coastal marshes. All of these have reduced both production and species diversity of submerged aquatic vegetation in open water habitats. The diversity and productivity of aquatic plant communities are also dependent upon maintenance of the historic continuum of fresh to saline marsh types. Water level and salinity management within marsh semi-impoundments are important tools for restoring and maintaining submerged aquatic vegetation production and species diversity. Conversion of emergent wetlands to open water through erosion of shorelines has enlarged some lakes and ponds to the point that wave fetch increases turbidity, which precludes the establishment and growth of submerged aquatic vegetation in these habitats. Construction of marsh terraces in larger open water wetlands to reduce wave fetch and turbidity can promote the establishment and growth of submerged aquatic vegetation.

Common reed (*Phragmites communis*) has become established within a large proportion of open water wetlands within intermediate marshes on the Refuge Complex. This plant is an aggressive invader which establishes along a pond periphery, and if not controlled, encroaches into open water where it forms dense homogeneous stands. Cattail (*Typha spp.*) and California bulrush (*Scirpus californicus*) are also aggressive plant invaders which form dense homogeneous stands in open water habitats in fresh and intermediate marshes. In fresh marsh environments such as the North Unit of McFaddin NWR, expansion of maiden cane (*Panicum hemitomen*) and giant cutgrass (*Zizaniopsis miliacea*) are also resulting in loss of open water habitats. Submerged aquatic vegetation production is substantially reduced due to shading and loss of substrate when extensive encroachment by these species occurs. Pond closure results in decreased habitat quality for waterfowl and other migratory bird species and fishery resources which utilize open water habitats. Pond closure has reduced availability of important breeding pair and brood rearing habitat for Mottled Ducks. Prescribed burning controlled grazing, water level and salinity management, mechanical removal and spot herbicide application are available tools for controlling these invasive species.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Manage water levels and salinities in managed marsh (semi-impoundments and impoundments) to maximize the annual production of desirable submerged aquatic plants.
- **Strategy 2** - Implement a control program for common reed, cattail and other invasive emergent plants which encroach into open water habitats, using integrated pest management (combining salinity control, prescribed burning, controlled grazing, mechanical removal and spot herbicide application) on selected units including the Deep Marsh, East Unit and Middleton Tract units of Anahuac NWR, and the White's Fee, Wild Cow Bayou, White's Pasture and North Unit of McFaddin NWR. Expand control efforts over the life of the CCP using the most effective strategies. (Anahuac NWR RONS Project #02001 - Control invasive plants to restore open water wetland habitats, McFaddin NWR RONS Project #02002 - Control invasive plants to restore open water wetland habitats, Anahuac NWR RONS Project #00002 - Improve coastal marsh management)
- **Strategy 3** - Install marsh terraces in large open water habitats to reduce marsh loss and enhance submerged aquatic plant production and diversity.
- **Strategy 4** - Develop enhanced on-site Geographic Information System capabilities to monitor status and trends of Refuge Complex wetlands on all four refuges in the Refuge Complex. Use GIS technology, remote sensing, radar surveys and other tools to map micro-topography and define watersheds, quantify water usage, and detect trends in open water to emergent marsh ratios and large-scale vegetative changes.

- **Strategy 5** - Facilitate and support a research study to identify causative factors of the “blackwater phenomenon” which negatively impacts submerged aquatic vegetation production in marsh habitats, and to guide development of adaptive management strategies to prevent or minimize these impacts. (Anahuac NWR RONS Project #97022 - Conduct blackwater study)

1-5 Years - Anahuac NWR:

- **Strategy 1** - Improve water level management capabilities in Shoveler Pond, the 480 Unit, Rail Reservoir, Moccasin Pond, Otter Pond, and East Unit South Reservoir by modifying existing and installing new water control structures. (Anahuac NWR RONS Project #97008 - Restore coastal freshwater wetlands)

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Enhance water management in Wild Cow Bayou Management Unit by installing additional water control structures along the GIWW and rehabilitating levees (LeBlanc’s Reservoir, Pond 11, and Pond 13). (McFaddin NWR RONS Project # 97004 - Restore and manage coastal wetlands)
- **Strategy 2** - Install marsh terraces to reduce fetch and turbidity and increase production of submerged aquatic vegetation in Willow Lake, LeBlanc’s Reservoir, Pond 28 and Pond 29 on McFaddin NWR. (McFaddin NWR RONS Project #97004 - Restore and manage coastal wetlands).
- **Strategy 3** - Enhance water management on the North Unit through design and construction of new water control structures/spillways and associated infrastructure. (McFaddin NWR RONS Project #97004 - Restore and manage coastal wetlands)
- **Strategy 4** - Enhance water management in Willow and Barnett Lake units of McFaddin NWR through design and construction of new water control structures along the GIWW. (McFaddin NWR RONS Project #97004 - Restore and manage coastal wetlands)

6-10 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Improve water level and salinity management in the Wild Cow Bayou Management Unit by modifying the existing western levee system to fully enclose this 5000-acre unit.

Objective C. Freshwater Prairie Wetlands (Palustrine). By Year 15 of the CCP’s implementation, maintain and manage approximately 1,900 acres of managed and natural shallow freshwater wetlands on the Refuge Complex and manage adjacent prairie habitats to improve nesting habitat for Mottled Ducks and other ground nesting migratory birds.

Rationale for the Objective: Nationwide, ninety-eight percent of all wetland losses during 1986-1997 were to freshwater wetlands (Dahl 1997). Losses of this habitat type have been substantial along the Texas Coast (Moulton *et al.* 1997). Native prairie habitats and their associated shallow prairie wetlands have been severely impacted. Over 95% of the native Gulf Coast prairies have been lost due mainly to development and agriculture (Stutzenbaker 1988), and these land use changes resulted in a major loss of prairie wetlands in Texas (Moulton *et al.* 1997). Mottled Ducks heavily utilize prairie habitats adjacent to freshwater wetlands for nesting (Stutzenbaker 1998), and the current decline in the Texas Gulf Coast population of this species is likely indicative of the loss and changing conditions of these habitats (Neaville 2001). A large portion of the upper Texas Coast prairie habitats have been cultivated for rice production, which provides valuable habitat for waterfowl, shorebirds, and many other migratory birds (Hobaugh *et al.* 1989, Wilson 2001). However, rice production has declined significantly during the last decade in counties surrounding the Refuge Complex, reducing available prairie wetland habitat for waterfowl, shorebirds and other wetland-dependent species.

Strategies

Throughout the Life of the CCP - Anahuac NWR:

- **Strategy 1** - Maintain annual cooperative rice farming acreage at 500-700 acres per year, while trying to increase the percentage of that acreage which is organically farmed.
- **Strategy 2** - Increase moist soil management acreage to 1,100 acres annually from the current 500 acres annually by developing 590 of new moist soil management units on the Old Anahuac, East Unit and Middleton Tract units. (Anahuac NWR RONS Project #97008 - Restore and enhance coastal freshwater wetlands, Anahuac NWR RONS Project 99001 - Enhance coastal wetlands management)
- **Strategy 3** - Restore 100 acres of shallow depressional prairie wetlands on the Granberry Tract Unit and the East Unit. (Anahuac NWR RONS Project #97008 - Restore and enhance coastal freshwater wetlands, Anahuac NWR RONS Project #99001 - Enhance coastal wetlands management)
- **Strategy 4** - Mow and/or hay 100 acres of transitional wet prairie annually to enhance migrational and wintering habitat for waterfowl and shorebirds.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Restore 100 acres of shallow freshwater wetland habitat on McFaddin NWR by developing moist soil units using water wells, levees and water control structures. (McFaddin NWR RONS Project #98004 - Restore and enhance coastal freshwater wetlands)

.6-15 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Create shallow freshwater wetland habitat in dredge material disposal sites along the GIWW on McFaddin NWR by installing levees and water control structures during future maintenance dredging cycles. This will involve development of cooperative projects with the U.S. Army Corps of Engineers.

GOAL 2. Conserve, enhance, and restore the Texas Chenier Plain region's coastal prairies and coastal woodlands to provide wintering, migrational, and nesting habitat for resident and migratory landbirds, including neotropical/nearctic migratory birds, and habitat for other native wildlife species.

Note: The following RONS Projects are Essential Staffing Positions which support coastal prairie and woodlands restoration, enhancement and management strategies:

Anahuac NWR RONS Project #98034 - Essential Staffing - Plant Ecologist
Anahuac NWR RONS Project #97058 - Essential Staffing - Wildlife Biologist
Anahuac NWR RONS Project #00007 - Essential Staffing - Refuge Operations Specialist
Anahuac NWR RONS Project #98004 - Essential Staffing - GIS Computer Specialist
Texas Point NWR RONS Project #00001 - Essential Staffing – Heavy Equipment Operator

Objective A. Native Prairie and other Grasslands. By Year 15 of the CCP's implementation, protect and manage all of the 5,744 acres of non-saline grassland habitats on the Refuge Complex, including "native prairie remnants", permanently fallowed croplands which are naturally revegetating, and sites previously restored to native prairie using intensive restoration techniques. Prescribed burning, controlled grazing, mowing (and haying) and exotic/invasive plant control would be the primary management tools employed. A second objective is to, within 15 years, restore an additional 2,223 acres of fallowed former cropland to native prairie on Anahuac NWR using intensive restoration techniques.

Rationale for the Objective

Over 9 million acres of native tall grass prairie once occurred along the Gulf Coast in Texas and Louisiana. It is now estimated that 99.8% and 99.6 % of little bluestem and eastern gamma grass/switch grass prairies, respectively, have been lost in Texas (McFarland 1995). Grassland birds have exhibited steeper and more consistent population declines during the last 25 years than any other group of North American species (Knopf 1995). Nine out of the 13 avian species listed as Rare and Declining with the Coastal Prairies Region in Texas (Shackelford and Lockwood 2000) are present in grasslands on the Refuge Complex. In 2005, the USFWS listed 7 avian species occurring in prairie habitats on the Refuge Complex as Species of Conservation Concern in the Gulf Prairies Bird Conservation Region.

Topography, soils, fire and grazing and trampling actions of herbivores, all in association with climate, are natural functions controlling grassland development (Ryan 1990). Fire in upland prairie prior to human occupation of the continent was started by lightning storms, primarily in mid-summer (Komarek 1964, Brag 1982, Higgins 1984, Gabrey *et al.*, 1999). The use of prescribed fire, grazing, mowing, and herbicides at different sites with varying soil moisture can produce the variety of habitats needed to support a diverse prairie avifauna (Ryan 1990). Restoration of native prairie, and an integrated management approach utilizing prescribed fire, exotic plant control and controlled grazing in upland grassland habitats is needed on the Refuge Complex to provide large blocks of nesting and wintering habitat for prairie-dependent avian and other wildlife species.

Strategies

Note: All of the native prairie restoration strategies to be implemented on the Refuge Complex during the 15-year planning horizon of the CCP are supported by the following RONS projects:

Anahuac NWR RONS Project #97009 - Restore native prairie
Anahuac NWR RONS Project #98059 - Acquire equipment used in prairie restoration
McFaddin RONS Project #03003 - Restore native prairie

Note: The prairie restoration and enhancement efforts described below will be implemented through partnerships with conservation organizations and volunteers.

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Utilize spring prescribed burning, rotational grazing, mowing/haying, and exotic plant control to maintain and enhance existing native prairie and other grassland habitats.
- **Strategy 2** - Revise the controlled grazing program on upland prairie units to include more short-duration/high-stocking rate grazing episodes.
- **Strategy 3** - Continue to conduct prescribed burns in prairie units in the spring, and initiate limited summer burning to help control invasive and exotic woody vegetation.
- **Strategy 4** - Enhance native plant diversity on existing grasslands by sprigging and seeding with native grasses and forbs.

Throughout the Life of the CCP - Anahuac NWR:

- **Strategy 1** - Restore an additional 2,223 acres of native prairie using intensive restoration techniques on the following management units: Gator Marsh – 97 acres, North Gator Marsh – 204 acres, Longtom Prairie – 186 acres, Pintail Marsh – 120 acres, Airstrip Prairie and East Bay Bayou Marsh – 1000 acres, Middleton Tract – 370 acres.
- **Strategy 2** - Construct a 5-acre native prairie propagation area on the East Unit to increase native grass seed production for future restoration efforts.

Objective B. Coastal Woodlands. By Year 15 of the CCP's implementation, create 29 acres of new coastal woodlots on the Refuge Complex, and protect and diversify the 127 acres of existing woodlots and riparian woodlands.

Rationale for the Objective

Coastal woodlots in the Chenier Plain region are extremely important to migrating songbirds. During the spring migration these woodlots provide essential feeding and resting areas for numerous neo-tropical migratory birds crossing the Gulf of Mexico (Rappole and Warner 1976, Sprunt 1975, Mueller 1981). Refuge Complex woodlands mark the first landfall for hundreds of thousands neotropical migratory birds making the trans-Gulf flights from Mexico, Central and South America during spring migration. These birds spend one to several days in these woodlands, resting and foraging to help replenish fat reserves before continuing their migration to breeding habitats. During the fall migration, coastal woodlots provide the last opportunity for trans-Gulf migrants to increase their fat levels necessary for crossing the Gulf of Mexico (Caldwell *et al.* 1963).

Six of the 7 avian species listed as Rare and Declining within the Coastal Prairies Region in Texas (Shackelford and Lockwood 2000) are present in Refuge Complex woodlands. In 2005, the USFWS listed 4 species that occur in Refuge Complex woodlands as avian Species of Conservation Concern in the Gulf Prairies Bird Conservation Region.

In pre-settlement times, coastal upland habitats in the Chenier Plain region were dominated by bluestem prairies and trees were restricted to riparian areas (Diamond and Smeins 1984, Smeins *et al.* 1991) and the more elevated chenier ridges. Woody habitat has significantly increased in the region with the rapid expansion exotic Chinese tallow trees. However, these new woodlands provide poor habitat for migrant songbirds (Barrow 2001). The amount of native coastal woodlot habitat in the Chenier Plain region has been reduced mainly through development, conversion to pasture and logging of bottomland hardwoods. Mueller (1981) estimated that only 22 woodlots of an acre or larger remain on the upper Texas Gulf Coast. Migrant landbirds made greater use of woodlots with larger trees and denser under stories (Mueller and Sears 1987). Increasing the quality of habitat in Refuge Complex woodlots for migratory landbirds requires removing exotic plants and increasing under story density and species diversity.

Note: All of the strategies for woodlot restoration and enhancement to be implemented on the Refuge Complex during the 15-year planning horizon of the CCP are supported by the following RONS Projects:

Anahuac NWR RONS Project #98035 - Restore and enhance coastal woodlots
Texas Point NWR RONS Project #95005 - Restore and enhance coastal woodlots
McFaddin NWR RONS Project #03004 - Restore and enhance coastal woodlots

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Utilize fencing and exotic plant control to protect existing woodland habitats; and,

plant native trees and shrubs to diversify woodlots and create additional understory.

- **Strategy 2** - Conduct site suitability assessment of additional areas on the Refuge Complex and work with partners to create additional woodlot habitats on suitable sites.
- **Strategy 3** - Expand feral hog control efforts.

1-5 Years - Anahuac NWR:

- **Strategy 1** - Diversify "The Willows" woodlot through plantings of native trees and under story shrubs.
- **Strategy 2** - Create a 1-acre woodlot on the East Unit (volunteer housing area).
- **Strategy 3** - Plant 1 acre of native trees around the new Visitor Information Station and enhance nearby woodlot with plantings of native trees, shrubs and wildflowers.

6-10 Years - Anahuac NWR:

- **Strategy 1** - Create a 27-acre woodlot (green tree reservoir) on the East Unit along East Bay Bayou.

GOAL 3. A comprehensive biological program will guide and support conservation efforts for all species of native fish, wildlife, and plants on the Texas Chenier Plain Refuge Complex.

Note: The following RONS Projects are Essential Staffing Positions which support an expanded biological program:

Anahuac NWR RONS Project #97058 - Essential Staffing - Wildlife Biologist
Anahuac NWR RONS Project #98004 - Essential Staffing - GIS Computer Specialist
Anahuac NWR RONS Project #98034 - Essential Staffing - Plant Ecologist
Anahuac NWR RONS Project #00007 - Essential Staffing - Refuge Operations Specialist

Objective A. Waterfowl, Shorebirds, and other Wetland-Dependent Migratory Birds. The objective is to help maintain healthy populations of species utilizing the Refuge Complex and to document population status and trends and habitat utilization of priority species.

Rationale for the Objective: Coastal habitats of the Texas Chenier Plain region provide important wintering and migrating habitat for waterfowl of the Central Flyway, and for millions of shorebirds, wading birds, colonial nesting waterbirds, and other wetland-dependent migratory birds. Monitoring and studies of population trends and habitat utilization provide information to assess management activities on the Refuge Complex. Data are also used in support of international, national and regional migratory bird conservation initiatives.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Conduct monthly aerial surveys of wintering and migrating waterfowl (September through March), on all four refuges in the Refuge Complex and annual breeding pair surveys to monitor Mottled Duck populations.

- **Strategy 2** - Conduct periodic spring and fall shorebird surveys in various representative wetland habitats.
- **Strategy 3** - Conduct annual nesting survey for colonial nesting waterbirds on Gulf shoreline of Texas Point NWR.
- **Strategy 4** - Participate in national, regional and local banding studies of migratory waterfowl and other migratory birds, including ongoing banding studies of Mottled Ducks and Snow Geese.
- **Strategy 5** - Facilitate and support occasional research studies on priority species through partnerships with universities and the USGS Biological Resources Division.
- **Strategy 6** - Collect data from harvested waterfowl at check stations including body condition indices and lead shot ingestion rates.
- **Strategy 7** - Participate in the annual Audubon Society Christmas Bird Count.
- **Strategy 8** - Conduct new surveys and studies for sensitive/declining species (see Objective , Threatened and Endangered Species, below).
- **Strategy 9** - Provide migrational habitat for shorebirds annually during March/April/May on 300 acres of the refuge's moist soil units. (Anahuac NWR RONS Project #97008 - Restore and enhance coastal freshwater wetlands, Anahuac NWR RONS Project #99001 - Enhance coastal wetlands management)
- **Strategy 10** - Maintain existing nesting habitat site for Least Terns on McFaddin NWR.
- **Strategy 11** - Establish nesting habitat for Least Terns and Black Skimmers by restoring an abandoned well pad on the Roberts-Mueller Tract.
- **Strategy 12** - Restore freshwater wetland and wooded habitat to reestablish a heron and egret rookery on the Roberts-Mueller Tract dredge disposal area.
- **Strategy 13** - Coordinate with the U.S. Army Corps of Engineers to evaluate and develop opportunities for creating colonial waterbird habitat through the beneficial use of dredge material.
- **Strategy 14** – Develop a step-down Inventory and Monitoring Plan to guide the Refuge Complex biological program.

The objective for Mottled Ducks is, by Year 15 of the CCP's implementation, breeding pair densities in suitable habitats on the Refuge Complex will increase to at least 11 breeding pairs per square mile (15-year average, 1988-2002). Additional information on the factors impacting Mottled Duck populations in the Texas Chenier Plain region will be gathered through applied research and monitoring.

Rationale for Objective: Recent data indicate that Mottled Duck populations are declining both on the Refuge Complex and on coastal refuges statewide (U.S. Fish and Wildlife Service 2001). Both spring breeding pair and September aerial surveys conducted by the USFWS indicate a steady decline in Mottled Duck populations on coastal national wildlife refuges in Texas over the last 16 years. Drought conditions along much of the Texas Coast during the mid- to late 1990's undoubtedly contributed to this decline. Other potential causative factors include loss of freshwater wetlands and upland nesting habitat due to land use changes, loss of pair bond, brood rearing and molting habitats due to invasive plant encroachment in open water habitats, brush encroachment in nesting habitats, increased predation by alligators, mammalian predators and fire ants, and lead shot ingestion rates that have remained high in some areas.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Utilize water level and salinity management, prescribed burning, and rotational grazing in managed marsh units (semi-impoundments and impoundments) to provide quality Mottled Duck brood-rearing, molting, and wintering habitat.
- **Strategy 2** - Restore pair pond and brood rearing habitats in key management units (those currently supporting breeding Mottled Ducks) by restoring open water habitats lost to invasive plant encroachment, using an integrated approach (an intensified program involving prescribed burning, controlled grazing, water level and salinity management, mechanical removal, and spot herbicide treatments). (Anahuac NWR RONS Project #02001 - Control invasive plants to restore open water wetland habitat, McFaddin NWR RONS #02002 - Control invasive plants to restore open water wetland habitat)
- **Strategy 3** - Maintain optimal nesting habitat utilizing an integrated brush control program which includes controlled grazing, prescribed burning, herbicide application, and mowing to reduce brush encroachment on levees, along fence lines and in salty prairie habitats. based on ongoing site-specific assessments. Fire occurrence in salty prairie and other optimum nesting cover will be managed using mowed green fire breaks and other innovative techniques.
- **Strategy 4** - Expand and refine the annual Mottled Duck breeding pair index survey on coastal refuges to include an assessment of habitat utilization by marsh type (fresh, intermediate, and brackish marshes).
- **Strategy 5** - Facilitate and support new research including studies to: 1) evaluate Mottled Duck nesting success and brood survival and identify factors affecting these vital rates; 2) determine habitat utilization and preferences during nesting, brood rearing, and molting periods; and 3) evaluate the effects of predation by alligators, mammalian predators and fire ants on Mottled Duck survival. This would include removing alligators and mammalian predators from key nesting and brood rearing habitats, and assessing impacts on nest success and duckling survival

Throughout the Life of the CCP - Anahuac NWR:

- **Strategy 1** - Restore and manage shallow freshwater habitat in upland management units to provide pair bonding and brood-rearing habitat. (Anahuac NWR RONS Project #97008 - Restore and enhance coastal freshwater wetlands, Anahuac NWR RONS Project 99001 - Enhance coastal wetlands management)
- **Strategy 2** - Create Mottled Duck pair ponds in and adjacent to intermediate marsh and salty prairie (key habitats in management units which still support breeding Mottled Ducks) by restoring wetlands at abandoned oil and gas well facilities and cattle watering sites.
- **Strategy 3** - Manage 400 acres of moist soil units annually specifically to provide brood-rearing habitat for Mottled Ducks during summer. (Anahuac NWR RONS Project #97008 - Restore and enhance coastal freshwater wetlands, Anahuac NWR RONS Project #99001 - Enhance coastal wetlands management)

Throughout the Life of the CCP - McFaddin NWR and Texas Point NWRs:

- **Strategy 1** - Enhance management capabilities for Mottled Ducks on 300 acres of freshwater impoundments within the Wild Cow Bayou Management Unit on McFaddin NWR by rehabilitating

existing levees and installing new water control structures. Intensively manage 400 acres of marsh habitat adjacent to freshwater impoundments as optimal brood-rearing habitat (McFaddin NWR RONS Project #97004 - Restore and manage coastal wetlands)

- **Strategy 2** - Restore freshwater wetlands as pair bonding and brood rearing habitat in and adjacent to salty prairie (key Mottled Duck nesting habitat) by establishing 100 acres of moist soil units. (McFaddin NWR RONS Project #98004 - Restore and enhance coastal freshwater wetlands)
- **Strategy 3** - Develop and maintain at least two grit sites for Mottled Ducks within the Wild Cow Bayou Management Unit of McFaddin NWR. (McFaddin NWR RONS Project #03002 - Develop grit sites for Mottled Ducks)

Objective B. Migratory and Resident Landbirds. The objective to help maintain healthy populations of species utilizing the Refuge Complex and to document population status and trends and habitat utilization of priority species.

Rationale for the Objective

Coastal habitats of the Texas Chenier Plain region provide important wintering, migrating and nesting habitat for migratory and resident landbirds. Monitoring and study of population trends and habitat utilization provides information to assess management activities on the Refuge Complex. Data are also used in support of international, national and regional migratory bird conservation initiatives.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Conduct periodic surveys of migratory and resident landbirds, including neotropical/nearctic migrants, in marsh, prairie and woodland habitats.
- **Strategy 2** - Facilitate and support occasional research studies on priority species through partnerships with universities and the USGS Biological Resources Division.
- **Strategy 3** - Participate in the annual Audubon Society Christmas Bird Count.
- **Strategy 4** - Conduct new surveys and studies for sensitive/declining species (see Objective D, Threatened and Endangered Species, below).
- **Strategy 5** – Develop a step-down Inventory and Monitoring Plan to guide the Refuge Complex biological program.

Objective C. Fish and other Aquatic Species. The objective is to ensure healthy populations and document population trends, status and habitat utilization of priority species on the Refuge Complex. A second objective is to incorporate fisheries and aquatic resource management into the management of all estuarine marshes on the Refuge Complex.

Rationale for the Objective .

Estuarine marsh habitats support over 95% of the Gulf of Mexico's commercial and recreational fisheries species during some portion of their life cycles.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Working with the USFWS Division of Fisheries, continue to support and facilitate periodic monitoring of fishery resources.
- **Strategy 2** - Retrofit existing water control structures and incorporate design features in any new structures to facilitate ingress and egress of living marine organisms in estuarine marshes.
- **Strategy 3** - Enhance marine organism access to and from managed marshes by managing water control structures to facilitate passage during key movement periods.
- **Strategy 4** - Expand coordination with the National Marine Fisheries Service and the Texas Parks and Wildlife Department on fisheries management issues and opportunities.

Objective D. Threatened and Endangered Species, Species of Conservation Concern, and other “Watch Species”. The objective is to support recovery efforts and to obtain information on population trends, status and habitat utilization of sensitive, declining or rare species occurring on the Refuge Complex.

Rationale for the Objective

Eight federally-listed Threatened and Endangered species occur on or adjacent to the Refuge Complex: Bald Eagle, Piping Plover, Brown Pelican, Loggerhead sea turtle, Kemp’s Ridley sea turtle, Green sea turtle, Hawksbill sea turtle, and Leatherback sea turtle. The sea turtles are found offshore in the Gulf and in Galveston Bay, but no nesting on beaches has been documented on the Refuge Complex. Of the federally-listed avian T&E species, the greatest information needs exist for Piping Plovers, whose winter range includes the upper Texas Gulf Coast.

The Refuge Complex also provides important habitat for 33 avian species identified by the USFWS as Avian Species of Conservation Concern within the Gulf Prairies Bird Conservation Region (BCR 37). Nine out of the 13 avian species listed by the Texas Parks and Wildlife Department as rare and declining species in coastal prairies and marshes in Texas are found on the Refuge Complex. The Texas Parks and Wildlife Department lists three species of reptiles which occur or potentially occur on the Refuge Complex as threatened: the smooth green snake, alligator snapping turtle and the Texas horned lizard. Several additional species of reptiles and amphibians are listed in the Texas Natural Heritage Database, now maintained by the Texas Nature Conservancy’s Texas Conservation Data Center. Little or no information about the relative abundance, distribution and habitat utilization of any of these species on the Refuge Complex is currently available.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Continue to participate in the annual coast-wide wintering Piping Plover survey.
- **Strategy 2** - Document the occurrence of Threatened and Endangered Species on the Refuge Complex during field surveys for other species.
- **Strategy 3** - Facilitate and support occasional research studies on sensitive and/or declining species through partnerships with universities and the U.S. Geological Survey, Biological Resources Division.

- **Strategy 4** - Report all incidences of stranded sea turtles to the National Marine Fisheries Service.
- **Strategy 5** - Expand coordination with federal and state agencies on sea turtle management including turtle releases and nesting activity monitoring. Continued expansion of Kemp's Ridley sea turtles into historic nesting range could include future nesting on the Gulf shoreline within McFaddin NWR.

Note: The following strategies for new surveys and monitoring of avian species of conservation concern to be initiated on the Refuge Complex during the 15-year planning horizon of the CCP are supported by the following RONS projects:

Anahuac NWR RONS Project #97014 - Conduct neotropical migratory bird surveys
 McFaddin NWR RONS Project #00011 - Conduct neotropical migratory bird surveys
 Anahuac NWR RONS Project #98052 - Conduct shorebird surveys
 Anahuac NWR RONS Project #98047 - Conduct Yellow Rail study
 Anahuac NWR RONS Project #98051 - Conduct Black Rail study
 McFaddin NWR RONS Project #03005 - Conduct American Bittern study
 McFaddin NWR RONS Project #00013 - Conduct fire effects study
 Anahuac NWR RONS Project #98048 - Conduct grazing study
 McFaddin NWR RONS Project #00009 - Conduct grazing study

Note: Strategies for new monitoring, surveys and studies on the Refuge Complex will support meeting informational needs for priority species identified in national and international conservation plans including the North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, North American Waterbird Conservation Plan, and Partners in Flight Regional Conservation Plan for the Gulf Prairies Bird Conservation Region (BCR 37) (currently in preparation). Refuge surveys and data collection will be integrated with and support regional, national and international surveys and databases whenever possible.

- **Strategy 6** - Initiate surveys to determine the relative abundance and habitat use of the following priority grassland birds which utilize Refuge Complex habitats during winter and/or migration periods: LeConte's Sparrow, Sprague's Pipit, Loggerhead Shrike, White-tailed Hawk, Northern Harrier, Short-eared Owl.
- **Strategy 7** - Expand Project Prairie Birds monitoring to include salty prairie and marsh habitats.
- **Strategy 8** - Conduct fall, winter and spring beach and bay surveys for the following priority shorebird and colonial water bird species: Piping Plover, Snowy Plover, Long-billed Curlew, Wilson's Plover, American Golden Plover, Short-billed Dowitcher, Reddish Egret, Least Tern, Black Skimmer, and Gull-billed Tern.
- **Strategy 9** - Conduct bi-weekly surveys in marsh and prairie wetland habitats (rice fields, moist soil units) on the Refuge Complex from February to May and July through September, to document relative abundance and habitat utilization and monitor population trends of the following priority shorebird and colonial water bird species: Buff-breasted Sandpiper, Hudsonian Godwit, American Golden Plover, American Bittern, Least Bittern, Wood Stork.
- **Strategy 10** - Initiate field surveys to monitor population trends of rail species on the Refuge Complex, including yellow rails and black rails.
- **Strategy 11** - Develop and maintain a database which documents the occurrence of rare species on the Refuge Complex.
- **Strategy 12** - Facilitate and support new monitoring/research studies to determine the breeding,

migrational and wintering distribution and habitat utilization of Black and Yellow rails.

- **Strategy 13** - Facilitate and support new monitoring/research studies to determine the breeding, migrational and wintering distribution and habitat utilization of American Bitterns.
- **Strategy 14** - Facilitate and support new research studies to determine the effects of prescribed burning and controlled grazing on sensitive or declining avian species.
- **Strategy 15** - Facilitate and support new research study to determine occurrence, relative abundance and habitat use of Short-eared and Burrowing Owls during wintering and migration periods.
- **Strategy 16** - Facilitate and support new research study to determine relative abundance and habitat use of White-faced and White Ibis on the Refuge Complex.

Anahuac NWR - 11-15 Years:

- **Strategy 15** - Following the successful restoration of native coastal prairie habitat on the Anahuac NWR, evaluate the potential to reintroduce Attwater's Prairie Chicken.

Note: The following strategies for new research and baseline monitoring on herptofaunal species of conservation concern to be initiated on the Refuge Complex during the 15-year planning horizon of the CCP are supported by the following RONS projects:

Anahuac NWR RONS Project #97012 - Conduct baseline herptological surveys
McFaddin NWR RONS Project #00007 - Conduct baseline herptological surveys

- **Strategy 17** - Facilitate and support new monitoring/research which evaluates the population status and habitat use of the following sensitive or declining reptile and amphibian species: pig frog, smooth green snake, alligator snapping turtle, Texas diamondback terrapin, Texas horned lizard, slender glass lizard, and crayfish snake.

Objective E. Mammals. The objective is to help maintain healthy populations and to document population status and trends and habitat utilization of priority species on the Refuge Complex.

Rationale for the Objective

Coastal habitats of the Texas Chenier Plain region support a diverse mammalian community.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Document the occurrence of mammals on the Refuge Complex during field surveys for other species.
- **Strategy 2** - Facilitate and support occasional research studies on mammals through partnerships with universities and the USGS Biological Resources Division.
- **Strategy 3** - Initiate monitoring of status and trends of muskrat populations on the Refuge Complex utilizing field surveys and GIS technology.
- **Strategy 4** - Facilitate and support monitoring to document species composition, habitat use and relative abundance of small mammal populations on the Refuge Complex.

- **Strategy 5** - Develop a step-down Nuisance Animal Control Management Plan. Manage muskrat and nutria populations utilizing trapping under Special Use Permit when necessary to prevent damage to emergent marsh habitats. Manage mesopredator populations (raccoons, striped skunk, grey and red foxes) as necessary to reduce predation on Mottled Ducks and their nests, and on other ground-nesting migratory bird species.

Objective F. Reptiles and Amphibians. The objective is to maintain healthy and naturally diverse populations, and to document population status and trends. The objective for Alligators is maintain healthy populations, but at densities consistent with migratory bird management objectives. In addition, enhanced monitoring capabilities will provide better information on the status and trends of the Refuge Complex alligator population, and harvest management will be directed at maintaining a natural population age structure.

Rationale for the Objective

Coastal habitats of the Texas Chenier Plain region support a diverse herptofaunal community. Several species of reptile and amphibians occurring on the Refuge Complex are State-listed as threatened or endangered or species of concern. The American alligator was first afforded protection under the Endangered Species Act in the late 1960's. Since then, populations have increased dramatically throughout its range. Nest counts conducted by the Texas Parks and Wildlife Department indicate a substantial increase in alligator numbers throughout its range in Texas (TPWD, Annual Alligator Reports). Areas within both hunted and non-hunted portions of nearby Cameron Parish, Louisiana have averaged greater than a 12% increase annually in the number of nesting female alligators since the early 1970's (Louisiana Department of Wildlife and Fisheries Annual Alligator Status Reports 1970-2000). Survey information on McFaddin NWR indicates a greater than 200% increase in the refuge alligator population during the past decade; a similar increase has been noted on Anahuac NWR.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Facilitate and support baseline monitoring to determine species composition and relative abundance of herptofaunal assemblages across habitat types on the Refuge Complex. (Anahuac NWR RONS Project #97012- Conduct baseline herptological surveys, McFaddin NWR RONS Project #00007 - Conduct baseline herptological surveys)
- **Strategy 2** - Facilitate and support new surveys and research on priority sensitive or declining reptile and amphibian species (see strategies under Threatened and Endangered species, above).
- **Strategy 3** - Continue to administer an adult alligator harvest program as an economic use on the Refuge Complex under the Texas Parks and Wildlife Department's alligator management program. Continue to implement modifications to the alligator harvest program to achieve the following harvest objectives: 1) increase the percentage of smaller size class alligators (less than 6') to a minimum of 30-40% of the annual harvest; and 2) decrease the percentage of larger alligators (greater than 9') to 5% or less.
- **Strategy 4** - Conduct annual aerial basking surveys and nighttime spotlight surveys to monitor alligator population trends.
- **Strategy 5** - Monitor recoveries of marked alligators on McFaddin and Anahuac NWRs to enhance monitoring of population trends.
- **Strategy 6** - Continue coordination and information sharing with the Texas Parks and Wildlife Department on alligator harvest management, population monitoring and research.

- **Strategy 7** - Conduct a research study to determine nesting frequencies of adult female alligators through monitoring of mitochondrial DNA within egg membranes. These data will be used to improve population estimates generated from aerial nest counts. (McFaddin NWR RONS Project # 02001- Conduct DNA alligator study)
- **Strategy 8** - In cooperation with TPWD, facilitate and support new research to determine the diet of alligators during spring and summer to evaluate influences of predation on Mottled Ducks and other native fish and wildlife.

Objective G. Invertebrates. The objective is to maintain healthy populations and natural diversity, and to document species occurrence on the Refuge Complex.

Rationale for the Objective

Many invertebrate species provide important food resources for migratory birds and other priority fish and wildlife species.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Work with partners to conduct baseline inventories of species occurrence and relative abundance. Cooperate with established inventory programs such as “Bio-Blitz” and annual North American Butterfly Association count.

Objective H. Plant Resources. The objective is to maintain native plant species diversity and document native plant species composition and plant community changes over time on the Refuge Complex.

Rationale for the Objective

Natural disturbances such as drought and floods, fire and herbivory by wildlife, and management activities such as grazing, prescribed burning, water level and salinity management all impact plant communities on the Refuge Complex. Sea level rise, subsidence and exotic plant and animal species are now also impacting native plant communities. Understanding how these events, processes and management activities affect plant community dynamics is essential to ensure long-term conservation of plant resources.

Strategies

Throughout the Life of the Plan and Refuge Complex-wide:

- **Strategy 1** - Assess habitat response to management activities including prescribed burning and grazing and natural perturbations such as fire and hurricanes through systematic field vegetation surveys and monitoring.
- **Strategy 2** - Facilitate and support periodic research and monitoring of plant resources and factors such as sea level rise, subsidence and exotic species which are impacting plant resources through partnerships with universities and the USGS Biological Resources Division.
- **Strategy 3** - Implement a systematic fire effects monitoring program in representative habitats on the Refuge Complex.

- **Strategy 4** - Facilitate and support new research to determine the effects of fire, fire seasonality and fire intensity on marsh surface elevation change and vegetative response. (Anahuac NWR RONS Project #97021 - Monitor marsh elevation change, McFaddin NWR RONS Project #00013- Conduct fire effects study)
- **Strategy 5** - Develop enhanced Geographic Information System capabilities and use in combination with remote imaging data to track and monitor vegetation changes in marsh habitats.
- **Strategy 6** - Develop and implement step-down Habitat Management Plans for each Refuge.

GOAL 4. By working with others locally and on a landscape level, address threats to natural biological diversity, ecological integrity, and environmental health on the Refuge Complex.

Note: The following RONS Projects are Essential Staffing Positions which support addressing ecosystem threats:

Anahuac NWR RONS Project #98011 - Essential Staffing - Oil and Gas Specialist
 Anahuac NWR RONS Project #98004 - Essential Staffing - GIS Computer Specialist
 Anahuac NWR RONS Project #98034 - Essential Staffing - Plant Ecologist
 Anahuac NWR RONS Project #97058 - Essential Staffing - Wildlife Biologist
 Anahuac NWR RONS Project #00007 - Essential Staffing - Refuge Operations Specialist Texas Point
 NWR RONS Project #00001 - Essential Staffing - Heavy Equipment Operator

Objective A. Coastal Habitat Loss

Objective A-1. By Year 15 of the CCP’s implementation, address threats from Relative Sea Level Rise and Reduced Sediment Supply by decreasing rates of coastal land loss due to shoreline erosion along the Gulf of Mexico, East Galveston Bay, and the GIWW.

Rationale for the Objective

Along the Texas Coast, wetland losses between the mid-1950’s and mid-1990’s were most substantial for estuarine emergent marshes (Moulton *et al.* 1997). Relative sea level rise and reduced coarse sediment supply to Gulf and bay nearshore littoral systems are resulting in significant loss of coastal habitats in the region. Average rates of shoreline retreat along the Gulf adjacent to the refuges are as high as 50 feet per year on Texas Point NWR, and 10-15 feet per year along most of McFaddin NWR (Bureau of Economic Geology unpublished data, Morton 1998). Over 800 acres of dunes and emergent marsh have been lost due to Gulf shoreline erosion on these refuges during the last 25 years, and remaining inland marshes are increasingly threatened by more frequent inundation during high tidal events. The predicted trend in relative sea level rise is a rise of over 2 feet over the next century, increasing the threats to coastal emergent marshes from accelerated shoreline erosion. Although less severe, erosion along the East Galveston Bay shoreline is also causing wetland loss on Anahuac NWR, and threatens remaining marshes with saltwater intrusion. Erosion along the GIWW is also causing direct loss of wetlands and poses a significant threat to marshes from saltwater intrusion on both McFaddin and Anahuac NWR. Levees created when the GIWW was excavated have almost entirely eroded away along significant portions of its length within these refuges.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Increase coordination with the U.S. Army Corps of Engineers, National Marine Fisheries Service, Texas General Land Office, Texas Parks and Wildlife Department, Texas Department of Transportation and other local, State and Federal agencies to develop and implement long-term interjurisdictional strategies to reduce coastal land loss along the Gulf of Mexico, East Galveston Bay, and the GIWW. Goals would include implementing major projects to restore the Gulf barrier beach/dune complex on McFaddin NWR (dependent upon the results of ongoing sand source investigations, possibly using off-shore sand supplies), to restore sediment supply to the Gulf's nearshore littoral zone on Texas Point NWR through the beneficial use of dredge material, and to construct structural protection (rock breakwaters) and restore emergent marshes along shorelines of Galveston Bay (Anahuac NWR) and the GIWW (Anahuac and McFaddin NWRs).
- **Strategy 2** - Participate in the U.S. Army Corps of Engineers new Regional Sediment Management program.
- **Strategy 3** - Coordinate with the U.S. Army Corps of Engineers on their ongoing Section 227 National Shoreline Erosion Demonstration Project in Jefferson County and their Shoreline Erosion Feasibility Study for Galveston and Jefferson counties.
- **Strategy 4** - Increase coordination among state, federal and local agencies on the issue of relative sea level rise and promote advanced conservation planning to address threats.

Throughout the Life of the CCP - Anahuac and Moody NWRs:

- **Strategy 1** - Working with the Galveston Bay Foundation, the Galveston Bay Estuary Program and other conservation partners, maintain existing offshore rock wavebreaks and restore emergent marsh by planting smooth cordgrass along the East Galveston Bay shoreline.
- **Strategy 2** - Working with partners, install an additional 7,500 linear feet of shoreline erosion abatement (offshore rock wave breaks) and restore 100 acres of under shore emergent marsh (smooth cordgrass plantings) along East Galveston Bay shoreline on Anahuac NWR. (Anahuac NWR RONS Project #97006 - Restore and protect coastal wetlands)
- **Strategy 3** - Working with partners, identify key areas needing protection and initiate shoreline protection activities (rock breakwaters, marsh plantings) along the GIWW, with a goal of protecting 10,000 linear feet of shoreline.
- **Strategy 4** - Increase coordination with landowners, USFWS Partners for Fish and Wildlife and Coastal programs to enhance shoreline protection on Moody NWR.

Throughout the Life of the CCP – McFaddin and Texas Point NWRs:

- **Strategy 1** - Working with the Texas General Land Office and other partners, maintain existing dune restoration project and explore opportunities for additional dune restoration along the Gulf of Mexico on McFaddin NWR. Restore an additional 5,000 linear feet of the dunes along the Gulf of Mexico on McFaddin NWR. (McFaddin NWR RONS Project #00001 - Restore dune habitats and protect coastal wetlands)
- **Strategy 2** - Working with the Texas General Land Office, maintain existing shoreline protection and seek opportunities for additional protection along the GIWW shoreline. Protect an additional 10,000 linear feet of GIWW shoreline on McFaddin NWR using offshore wavebreaks, shoreline

armoring, and/or emergent plantings (smooth cordgrass). (McFaddin NWR RONS Project #00017 - Restore and protect coastal wetlands

- **Strategy 3** - Coordinate with the U.S. Army Corps of Engineers and other partners to implement additional projects to beneficially use dredge materials from the Sabine-Neches Ship Channel to reduce land loss by restoring sediment supply to the Gulf shoreline on and adjacent to Texas Point NWR.

Objective A-2. By Year 15 of the CCP's implementation, address threats from Altered Hydrologic Processes and resulting Interior Marsh Loss by reducing saltwater intrusion, increasing freshwater and mineral sediment inflows to marshes, and maintaining natural marsh hydroperiods.

Rationale for the Objective

Land subsidence and sea level rise, channel construction, and channelization of natural waterways have had significant hydrologic impacts on coastal marshes including saltwater intrusion, increased tidal energies causing erosion of organic marsh substrates, loss of freshwater inflows and reduced mineral sediment supply, and excessive flooding or drainage/drying. Over the last century, these processes have gradually converted extensive areas of fresh and intermediate marshes to a more brackish regime thereby decreasing natural biological diversity. Fresh and intermediate marshes support more diverse avifaunal (Mitsch and Gosselink 1993) and plant communities (Chabreck 1988, Chabreck *et al.* 1989, Mitsch and Gosselink 1993) than do brackish and saline marshes. In some areas, these processes have resulted in the conversion of vegetated emergent marshes to open water (marsh loss). Loss of estuarine marshes through conversion to open water has been significant in the region since the mid-1950's (Moulton *et al.* 1998). Relative sea level rise further threatens vegetated marshes through increased saltwater intrusion and submergence. The current projection for relative sea rise in the region is a rise of over 2 feet over the next century. To survive, remaining marshes must accrete or gain elevation at a rate that keeps up with sea level rise. Maintaining plant productivity through active management and preventing loss of organic marsh soils by restricting saltwater intrusion and tidal energies, increasing freshwater inflows, and beneficially using dredge materials to restore mineral sediment supply appear to offer the most realistic options for reversing current trends of interior marsh loss in the Chenier Plain region.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Expand coordination with local state, and federal agencies to develop and implement watershed-scale hydrologic restoration projects. A key component will be assessing the feasibility of and identifying options for restoring freshwater inflows to coastal marshes south of the GIWW.
- **Strategy 2** - Expand coordination with the U.S. Army Corps of Engineers, Texas General Land Office, Texas Parks and Wildlife Department, Texas Department of Transportation and other local, State and Federal agencies to develop strategies to restore and enhance wetlands on the Refuge Complex through the beneficial use of dredged materials. This will include participating in the U.S. Army Corps of Engineers new Regional Sediment Management program.
- **Strategy 3** - Coordinate with state and federal agencies and others to implement a hydrologic restoration project aimed at stopping emergent marsh loss (conversion of emergent marsh to open water) on J.D. Murphree WMA, Sea Rim State and private lands in the eastern portion of the Salt Bayou watershed in Jefferson County. Reducing saltwater intrusion and tidal energies by reducing the influence of the Keith Lake Fish Pass will be a key component of this strategy.
- **Strategy 4** - Actively manage water levels and salinities in managed marsh units (semi-

impoundments and impoundments) utilizing water control structures, levees and water delivery and drainage infrastructure to maintain a continuum of brackish to fresh conditions and desirable marsh hydroperiods (wetting and drying cycles).

- **Strategy 5** - Monitor status and trends of wetlands on all four refuges in the Refuge Complex by developing enhanced on-site Geographic Information System capabilities.
- **Strategy 6** - Develop partnerships with the U.S. Geological Survey and facilitate and support new research on marsh accretion and its relationship to management practices including burning and structural marsh management.
- **Strategy 7** - Restore marsh hydrology by removing barriers formed by abandoned roads, levees and well pads remaining from past oil and gas development.

1-5 Years - Anahuac and Moody NWRs:

- **Strategy 1** - Research the availability of, and if possible, acquire additional water rights to facilitate increasing freshwater inflows to the East Unit from East Bay Bayou and Onion Bayou and to the Middleton Tract from Elm Bayou. (Anahuac NWR RONS Project #98003 - Develop and implement Refuge Complex Water Management Plan)
- **Strategy 2** - Ensure adequate freshwater in-flows and reduce saltwater intrusion through annual water purchases and enhanced water management infrastructure including new pumps and delivery systems. (Anahuac NWR RONS Project #99001 - Enhance coastal wetlands management).
- **Strategy 3** - Protect and enhance management of intermediate and fresh marshes on the Deep Marsh Unit (New Ditch water control structure), and on the East Unit and Middleton Tract Unit by replacing water control structures and restoring levees along East Bay and Elm bayous.
- **Strategy 4** - Coordinate with Trinity Bay Conservation District and other partners to repair saltwater barriers and water control structures on East Bay, Elm and Onion bayous and on the Moody NWR.
- **Strategy 5** - Increase coordination with landowners, other USFWS divisions and state and federal agencies to restore hydrology by reducing saltwater intrusion on Moody NWR.

6-10 Years - Anahuac NWR:

- **Strategy 1** - Construct rock weirs and restore man-made channels to marsh elevation on western portion of Pace Tract.

11-15 Years – Anahuac NWR:

- **Strategy 1** - Eliminate hydrological barriers by removing former rice levees and restore freshwater sheet flows from upland areas to marshes on the East Unit.
- **Strategy 2** - Construct a passive overflow spillway structure on East Bay Bayou to restore over bank flooding and freshwater inflows into East Unit marshes.
- **Strategy 3** - Construct a passive overflow spillway structure on Elm Bayou to restore over bank flooding and freshwater inflows into Middleton Tract marshes.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Restore hydrology on both refuges by reducing saltwater intrusion and restoring hydro-periods through construction of rock weirs or earthen plugs in artificial (man-made) channels on both refuges (north of Texas Bayou, Willow and Barnett Lakes). (McFaddin NWR RONS Project #00016 - Restore coastal wetlands through hydrological restoration, Texas Point NWR RONS Project #00002 - Restore coastal wetlands through hydrological restoration).
- **Strategy 2** - Coordinate with local, state and federal agencies to assess the feasibility of and identify options for restoring freshwater inflows to coastal marshes within the Salt Bayou watershed south of the GIWW.
- **Strategy 3** - Research the availability of and need for acquiring water rights to ensure that freshwater inflows remain adequate to maintain the natural diversity and productivity of the Willow Slough marsh. (Anahuac NWR RONS Project #98003 - Develop and implement Refuge Complex Water Management Plan)

6-15 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Coordinate with state and federal agencies and others to develop and implement a comprehensive hydrological restoration project to restore marshes on Texas Point NWR. Reducing saltwater intrusion and tidal energies by restoring Texas Bayou and its tributaries to historic dimensions will be a key component of this project.
- **Strategy 2** - Coordinate with state and federal agencies and others to develop and implement a hydrological restoration project to restore marshes on the western portion of McFaddin NWR. Reducing saltwater intrusion and tidal energies by restoring Mud Bayou to its historic dimensions will be a key component of this project.

Objective B. Invasive Species. The objective for addressing threats from invasive species is to utilize Integrated Pest Management strategies to implement a comprehensive invasive species control program which will: 1) reduce current infestations by 50% by Year 15 of the CCP's implementation and 2) prevent any new infestations.

Rationale for the Objective

Monocultures of invasive plants reduce natural biological diversity, increase erosion, alter nutrient cycling and displace macro- and micro-fauna that depend on native plants for habitat and food (Sheley and Petroff *et al.* 1999). Early detection of invading plant communities can minimize spread (Navaratnam and Catley 1986) and reduce future control efforts and costs. Refuge habitats are currently significantly impacted by invasive exotic plants and animals including: Chinese tallow (*Sapium sebiferum*), water hyacinth (*Eichhornia crassipes*), alligator weed (*Alternanthera ohilcoeroides*), water lettuce (*Pistia stratiotes*), McCartney rose (*Rosa bracteata*), vasey grass (*Paspalum urvillei*), Johnson grass (*Sorghum halepense*), deeprooted sedge (*Cyperus entrerianus*), Eurasian water milfoil (*Myriophyllum spicatum*), hydrilla (*Hydrilla verticillata*), Salvinia minima, Japanese honeysuckle (*Lonicera japonica*) red imported fire ants, nutria, and feral hogs. Giant Salvinia (*S. molesta*), to date documented on the Refuge Complex only once and in small amounts near a refuge boat ramp, has been found nearby and poses a significant threat to freshwater wetlands. Invasive native plant species include eastern baccharis (*Baccharis halimifolia*), big-leaf sumpweed (*Iva frutescens*), rattlebox (*Sesbania drummondii*), common reed (*Phragmites communis*) and cattail (*Typha spp.*).

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Implement an integrated invasive species control program on the Refuge Complex,

and update the Integrated Pest Management Plan to reflect a comprehensive approach to invasive species management.

- **Strategy 2** - Expand field monitoring to provide early detection of new infestations, and develop enhanced GIS capabilities to map existing and new stands of upland and aquatic exotic and invasive plants.
- **Strategy 3** - Develop new partnerships with universities and the U.S. Geological Survey Biological Resources Division to evaluate control strategies.
- **Strategy 4** - Annually treat 25% of all Chinese tallow trees seven feet tall or four inches in diameter on the Refuge Complex using basal bark herbicide applications, and utilizing mowing, fire and spot herbicide applications on smaller Chinese tallow trees.
- **Strategy 5** - Utilize salinity management, mechanical removal and spot herbicide treatments to control water hyacinth in freshwater habitats and near water control structures and in water delivery systems.
- **Strategy 6** - Utilize salinity management, fire, mowing and spot herbicide treatment to control invasive aquatic plants such as cattail and common rush on the Refuge Complex.
- **Strategy 7** - Develop invasive aquatic plant interpretive signs and install them at all Refuge Complex boat ramps.
- **Strategy 8** - Evaluate use of approved and permitted biological control agents as they become available, for use in IPM program for exotic and invasive species control. An approved biological control agent for *Salvinia* spp. is now available for release in Texas, and its use on the Refuge Complex will be evaluated.
- **Strategy 9** - Develop step-down Feral Hog Management and Nuisance Animal Management plans. Expand control efforts for feral hogs and nutria as necessary.

1- 5 Years - Anahuac NWR:

- **Strategy 1** - Evaluate control strategies for deep-rooted sedge and several exotic grasses, including newly discovered King Ranch bluestem, currently impacting prairie and wet prairie habitats.
- **Strategy 2** - Mechanically remove Chinese tallow along the GIWW, Oyster Bayou, East Bay Bayou, Onion Bayou, and State Highway 124.
- **Strategy 3** - Expand coordination with the Trinity Bay Conservation District and the Chambers-Liberty Counties Navigation District on control of aquatic and terrestrial invasive plants on waterways, canals and ditches and on banks and levees within drainage and irrigation easements through the Anahuac NWR.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Expand integrated control program for water hyacinth in the Willow Slough Marsh on the North Unit of McFaddin NWR. (McFaddin NWR RONS Project #00002 - Control exotic and invasive species)
- **Strategy 2** - Utilize spot herbicide treatments to help control McCartney rose on non-saline prairie habitats. (McFaddin NWR RONS Project #00002 - Control exotic and invasive species)

- **Strategy 3** - Expand control efforts for Chinese tallow on Texas Point NWR and the North Unit of McFaddin NWR.

Objective C. Contaminants. The objective for the threat from contaminants is, by Year 15 of the CCP's implementation, identify and monitor all potential point and non-point source pollution impacts to the Refuge Complex and develop a strategy to clean up contaminants and protect refuge resources from those impacts.

Rationale for the Objective

Contaminant issues affecting the Refuge Complex include potential petroleum and petrochemical spills from: 1) on-Refuge oilfield operations; 2) shipping on the GIWW; and 3) offshore production in the Gulf. The potential for petrochemical and petroleum spills affecting the Refuge Complex is high. Over 20 active oil and gas wells are currently producing on the Refuge Complex. Significant drilling and production activity occurs in Gulf waters offshore of McFaddin and Texas Point NWRs. The GIWW between Houston and Lake Charles, Louisiana is one of the busiest reaches of this waterway for shipping petrochemical and petroleum products. The GIWW parallels much of McFaddin and Anahuac NWRs, and the Sabine-Neches Ship Channel parallels Texas Point NWR. Former and current oil and gas production areas on the Refuge Complex contain extensive infrastructure which is no longer in use, including flow lines, pipelines, oil pits, well pads, and brine disposal areas. Many of these lines, pits, and pads may contain contaminants including heavy metals, normal occurring radio-active material, brine, and petroleum products. In addition, Refuge Complex marshes comprise the downstream end of at least 10 waterways. Factories, refineries, solid waste disposal sites, oil field sludge disposal areas, feedlot operations, agricultural operations and housing developments are potential pollution sources in upstream reaches of these watersheds. Finally, spent lead shotgun pellets may still pose a threat to waterfowl and other wildlife in the region. The incidence of lead shot in Mottled Duck gizzards remains relatively high to the present in birds harvested on the Anahuac and McFaddin NWRs, even after over 15 years of implementation of non-toxic ammunition regulations.

Strategies

Throughout Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Working with the USFWS' Division of Ecological Services Environmental Contaminants program, conduct periodic monitoring and studies of contaminant levels and impacts to fish and wildlife resources.
- **Strategy 2** - Facilitate and support research and monitoring on contaminants and contaminant impacts to fish and wildlife resources through partnerships with universities and the USGS Biological Resources Division.
- **Strategy 3** - Continue monitoring of lead shot ingestion rates in Mottled Ducks.
- **Strategy 4** - Develop comprehensive spill response plan for incidents occurring off-refuge which threaten Refuge Complex resources. A first step in plan development will be increasing coordination with interagency and private spill response teams.
- **Strategy 5** - Assemble a qualified first responder team comprised of Refuge Complex staff through training and participation in interagency spill response drills.
- **Strategy 6** - Conduct a thorough inventory and assessment of abandoned oil and gas infrastructure and possible contaminants issues on the Refuge Complex, and develop plan for removal and habitat restoration. Initiate removal of abandoned oil and gas production infrastructure including well pads, access roads, and flow lines.

- **Strategy 7** - Facilitate and support water quality monitoring in Taylors Bayou, Willow Slough, Spindletop Bayou, Mud Bayou, Oyster Bayou, Robinson Bayou, East Bay Bayou, Onion Bayou, Elm Bayou and the GIWW.
- **Strategy 8** - Facilitate and support field assessment to identify any potential “hot spots” of lead contamination from lead shot on the Refuge Complex. Develop and implement management actions for remediating any areas with high levels of lead.

Objective D. New Oil and Gas Development. The objective for managing new oil and gas exploration and development is to ensure that new oil and gas exploration and development activities on the Refuge Complex is conducted in the most environmentally-sensitive manner possible by defining a process which facilitates close coordination with industry and timely processing of requests to conduct activities, and which mandates the use of scientifically-accepted “best management practices” for these activities in sensitive coastal environments.

Strategies

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Coordinate with oil and gas interests on all exploration and development activities on the Refuge Complex, and administer such activities under USFWS policy and regulations through issuance of Special Use Permits.
- **Strategy 2** - Develop and implement a step-down Oil and Gas Management Plan for the Refuge Complex.

GOAL 5. All local, national, and international visitors will enjoy safe and high quality outdoor experiences on the Refuge Complex and learn of the Refuge Complex’ role in conserving the region’s coastal natural resources. New partnerships with our local communities will be forged to highlight, promote, and conserve the unique natural assets of the upper Texas Gulf Coast.

Note: The following RONS projects are Essential Staff positions which support expansion of wildlife-dependent recreational opportunities and outreach activities to promote community partnerships. The Law Enforcement position supports the upcoming transition from collateral duty refuge officers to full-time refuge officers, and will enhance protection of refuge resources and public safety throughout the Refuge Complex.

Texas Point NWR RONS Project #00001 - Essential Staffing - Heavy Equipment Operator
 Anahuac NWR RONS Project #98034 - Essential Staffing - Plant Ecologist
 Anahuac NWR RONS Project #97058 - Essential Staffing - Wildlife Biologist
 Anahuac NWR RONS Project #00007 - Essential Staffing - Refuge Operations Specialist
 McFaddin NWR RONS Project #98007 - Staffing - Refuge Law Enforcement Officer

Objective A. Hunting. By Year 15 of the CCP’s implementation, 90% of all hunting visits on the Refuge Complex will qualify as high-quality hunting experiences.

We define “a high-quality hunting experience” as one that: 1) promotes safety of participants, other visitors, and facilities; 2) promotes compliance with applicable laws and regulations and responsible behavior; 3) minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan; 4) minimizes or eliminates conflicts with other compatible wildlife-dependent

recreation; 5) minimizes conflicts with neighboring landowners; 6) promotes accessibility and availability to a broad spectrum of the American people; 7) promotes resource stewardship and conservation; 8) promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources; 9) provides reliable/reasonable opportunities to experience wildlife; 10) uses facilities that are accessible to people and blend into the natural setting; and 11) uses visitor satisfaction to help define and evaluate programs.(USFWS Service Manual 605 FW 1).

Our objective will be met if 90% or more of hunting visits meet the standards set for a high-quality hunting experience, as determined annually by hunter comments collected at the hunt check stations. As such, 1) less than 10% of hunters will report feeling unsafe; 2) less than 10% of hunters will report feeling crowded; 3) no hunter will report unfairness in obtaining access to hunt; 4) less than 5% of hunters contacted will be cited for hunting violations during routine enforcement; and 5) there will be no hunting-related safety incidents.

Rationale for the Objective

Waterfowl hunting is a long and established tradition in the coastal marshes of southeast Texas (McNear, 1956). Hunters have long contributed to the conservation of waterfowl and their habitats through the purchase of federal Migratory Bird Hunting and Conservation Stamps (Duck Stamps). Since 1934, more than 4.2 million acres of wetlands have been purchased for protection through Duck Stamp revenues of more than \$450 million. (USFWS 1995). Due to the remoteness and wetland environment of these refuges, hunting access is challenging and is a key factor when providing for hunting opportunities. Improving and managing hunting access will facilitate high-quality hunting experiences. Providing more information to hunters, increasing "Designated Hunt Area" opportunities to reduce crowding problems in designated areas, and providing additional hunting opportunities will also contribute to an overall high-quality hunting experience.

Strategies

Note: Facility development will focus on partnership opportunities with local, county and state agencies and with our Refuge Friends groups and other conservation and outdoor recreation organizations.

Throughout Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Provide waterfowl hunting opportunities on approximately 38,000 acres of the Refuge Complex. Opportunities include assigned area by reservation or drawing hunts, controlled entry hunts which limit overall numbers of hunters in a particular hunt unit, and unrestricted entry hunts. Reservation, drawing, and controlled entry hunts require a fee permit, while unrestricted hunts do not. All refuge hunters must possess a general refuge hunting permit.
- **Strategy 2** - Administer the waterfowl hunt program under current regulations. Hunting on all hunt units is allowed three (3) day per week until noon, except the Pace Tract on Anahuac NWR which is open seven days per week until noon.
- **Strategy 3** - Maintain existing access facilities which support the hunting program including check stations, roads, boat ramps, boat rollers, parking areas, footbridges and waterways.
- **Strategy 4** - Develop detailed step-down Hunt Management Plans (as part of the Refuge Complex Visitor Services Plan) for the Anahuac, McFaddin and Texas Point NWRs.
- **Strategy 5** - Revise the hunting permit fee system to provide for a Refuge Complex-wide annual waterfowl hunting permit.
- **Strategy 6** - Develop an Internet-based system for obtaining fee area hunting permits.

- **Strategy 7** - Improve public safety and education and outreach with an expanded and enhanced law enforcement program. (McFaddin NWR RONS Project # 00005)
- **Strategy 8** - Develop and produce hunting area maps that provide detailed information on locations, access, special features, safety and ethical behavior.
- **Strategy 9** - By Year 5 of the CCP's implementation, implement a 25-hp restriction on inland waters in designated Hunt Units to improve public safety and minimize habitat damage.

1-5 Years - Anahuac NWR:

- **Strategy 1** - Construct footbridges across Onion Bayou and over canals to the North Reservoir on the East Unit to improve hunter access.
- **Strategy 2** - Enhance boat access within the East Unit and the Middleton Tract Unit through improved maintenance of access ditches.
- **Strategy 3** - Provide additional "Designated Hunt Areas" on a first-come, first-serve basis on the East Unit.
- **Strategy 4** - Open designated portions of the East Unit during the September Early Teal season.
- **Strategy 5** - Open designated area(s) to dove hunting, using a Cooperative Agreement with the Texas Parks and Wildlife Department to include open areas in their "Short Term Public Hunting Lease Program."

6-15 Years - Anahuac NWR:

- **Strategy 1** - Install information kiosks at the Oyster Bayou boat ramp, providing orientation map to hunting units, access points, hunt regulations, and safety information.
- **Strategy 2** - Develop directional signage to refuge hunting areas for hunters accessing the refuge via navigable waters.
- **Strategy 3** - Improve the Boat Canal/Oyster Bayou boat launch and parking area.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Provide seasonally-open primitive access (4-wheel drive trail) on the Gulf of Mexico beach ridge on McFaddin NWR (permanent or temporary action dependent upon ultimate disposition of State Highway 87 project), for access to hunt areas during waterfowl seasons.
- **Strategy 2** - Reduce conflicts between waterfowl hunters on the Star Lake/Clam Lake Hunt Unit during the regular waterfowl season by requiring all hunters in this unit to register at the check station, including those accessing the unit from the Gulf beach along Perkins Levee or the Brine Line, and by requiring all hunters accessing Star Lake and associated waters by boat to access via the refuge's Star Lake boat launch.
- **Strategy 3** - Provide additional "Designated Hunt Area" duck hunting opportunities on McFaddin NWR.
- **Strategy 4** - Reestablish and maintain the shallow ditch system for boat access within the Central Hunt Unit.

6-15 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Construct a new hunter check station at McFaddin NWR.
- **Strategy 2** - Install information kiosks on McFaddin and Texas Point NWRs, providing orientation map to hunting units, access points, hunt regulations, and safety information.
- **Strategy 3** - Developed improved boat access (inlet dredging, dock and levee crossover) from the GIWW to the Central Hunt Unit.

Objective B. Fishing. By Year 15 of the CCP's implementation, 90% of all fishing visits on the Refuge Complex will qualify as high-quality fishing experiences, as determined by angler comments documented during routine visitor contacts. We define a high-quality fishing experience is defined as one that: 1) is available to a broad spectrum of the fishing public; 2) provides an opportunity to use various angling techniques; 3) provides opportunities in both freshwater and saltwater environments; and 4) reflects positively on the individual Refuge, the Refuge System and the USFWS.

Rationale for the Objective

The Refuge Complex offers exceptional recreational fishing and crabbing opportunities in both saltwater and freshwater environments. Improving access for fishing and providing additional education on fishing and fishing opportunities on the Refuge Complex will help facilitate high-quality fishing experiences.

Strategies

New facility and program development will focus on partnership opportunities with local, county and state agencies and with Refuge Friends groups and other conservation and outdoor recreation organizations.

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Maintain existing access facilities which support the fishing program including roads, boat ramps, parking areas, fishing piers and trails.
- **Strategy 2** - Host annual National Fishing and Boating Week event on Anahuac NWR.
- **Strategy 3** - Develop a brochure clearly defining fishing areas, including maps of access points for fishing opportunities, regulations and providing information on some of the more popular game fish species.
- **Strategy 4** - Develop Internet-based availability of fishing information.
- **Strategy 5** – Develop step-down Fishing Plans (as part of the Refuge Complex Visitor Services Plan) for the Anahuac, McFaddin and Texas Point NWRs.

1-5 Years - Anahuac NWR:

- **Strategy 1** - Improve access for fishing on East Galveston Bay by constructing a boardwalk and fishing platform from Frozen Point Road to the Bay.
- **Strategy 2** - Develop walk-in access for fishing at Coon Creek, Oyster Bayou, and between Shoveler Pond and Westline Road.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Extend open hours on McFaddin NWR (to designated areas accessible via Clam Lake Road and Star Lake Road) to one hour before sunrise to one hour after sunset daily to facilitate additional recreational fishing and other wildlife-dependent recreational opportunities.
- **Strategy 2** - Construct fishing/crabbing piers on 10-Mile Cut/Clam Lake and Star Lake.
- **Strategy 3** - Construct a new boat launch and parking facilities on 10-Mile Cut.
- **Strategy 4** - Develop freshwater fishing opportunities on Pond 13.
- **Strategy 5** - Coordinate and partner with local, county and state agencies to improve a primitive boat launching area off Pilot Station Road in Sabine Pass, to improve boat access to Texas Bayou and Texas Point NWR.

Objective C. Wildlife Observation and Photography. By Year 15 of the CCP's implementation, Refuge Complex visitors will enjoy several new high quality opportunities to view and photograph wildlife in managed and restored habitats.

Rationale for the Objective

Because overall management of the Refuge Complex will emphasize active habitat management and habitat restoration, new wildlife viewing and photography opportunities will be developed for both managed and restored habitats such as marsh semi-impoundments and moist soil units, and in restored native habitats including wetlands, prairies and woodlots. These facilities will improve viewing opportunities for wetland-dependent migratory birds, grassland birds and neotropical migratory birds, butterflies and other native wildlife. Close, personal experiences with nature help foster a deeper appreciation for fish and wildlife and their habitats.

The Anahuac NWR was approved for the collection of a general entrance fee (for that portion of the Refuge which is open to the public 365 days per year) under the Recreation Fee Demonstration Program (Fee Demo Program) in 1997. In addition to collecting a general entrance fee, the Refuge concurrently proposed to make an annual \$40 permit for waterfowl hunting on the East Unit hunt unit available to refuge hunters (as an option in addition to the existing \$10 per day user fee). Participation by the Service in the Fee Demo Program was authorized under the Omnibus Consolidated Recission and Appropriations Act (P.L. 104-154) of 1996. This law was superceded by the passage of the Federal Lands Recreation Enhancement Act in 2004, which rolled all approved programs under the Fee Demo Program into the new Recreation Fee Program. Although the Refuge was approved to collect both the entrance fee and the annual hunting permit fee under the Fee Demo Program in 1997, to date only the East Unit annual waterfowl hunting permit has been implemented. The goals of initiating an entrance fee on Anahuac NWR would be to continue to enhance the experience of refuge visitors and to expand wildlife-dependent recreational and educational opportunities. Specifically, Refuge entrance fees would be used to help maintain and expand existing visitor facilities and programs, as well as to develop new facilities and programs, including trails, boardwalks, observation platforms and photography blinds, fishing piers, and environmental education and interpretive materials and programs.

Strategies

New facility and program development will focus on partnership opportunities with local, county and state agencies, industry and with our Refuge Friends groups and other conservation and civic organizations.

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** – Maintain existing facilities which support wildlife observation and photography including roads, parking areas, trails, observation platforms, boardwalks, and photography blinds.

- **Strategy 2** - Institute an entry fee program on Anahuac NWR for refuge visitors, available as day passes or annual entry permits (Refuge Complex annual hunting permit will also serve as annual entry permit).
- **Strategy 3** – Develop step-down Wildlife Observation and Photography/Environmental Education and Interpretation plans (as part of the Refuge Complex Visitor Services Plan) for the Anahuac, McFaddin and Texas Point NWRs.

1-5 Years - Anahuac NWR:

- **Strategy 1** - Complete the butterfly habitat and native habitat demonstration area adjacent to the Visitor Information Station. (Anahuac NWR RONS Project 03000 - Develop and interpret butterfly habitat)
- **Strategy 2** - Construct a new observation platform overlooking Oyster Bayou Moist Soil Units.

6-15 Years - Anahuac NWR:

- **Strategy 1** - Construct a tree-canopy height observation platform on the East Bay Bayou Trail to provide observation and photography opportunities in rice and moist soil units.
- **Strategy 2** - Develop a self-guided canoe and kayak trail on East Bay Bayou.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Construct a connecting trail and observation platform on Texas Point NWR.
- **Strategy 2** - Construct a parking area and observation platform at the McFaddin NWR Clam Lake Road entrance.
- **Strategy 3** - Develop a levee trail and boardwalk for wildlife observation on McFaddin NWR.
- **Strategy 4** - Construct a wildlife viewing platform at the new McFaddin NWR headquarters office.
- **Strategy 5** - Maintain a levee trail along Perkins Levee (open seasonally for wildlife observation and photography, outside of the waterfowl hunting season).

6-15 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Construct a photography blind on McFaddin NWR.
- **Strategy 2** - Develop a self-guided canoe and kayak trail along 10-Mile Cut from McFaddin NWR to Sea Rim State Park.

Objective D. Environmental Education and Interpretation. By Year 15 of the CCP's implementation, 90% of visitors will feel that they have increased their knowledge of native fish, wildlife and plants and of the Refuge Complex's role in conserving these resources through habitat management and restoration and addressing threats to ecosystem health.

Rationale for the Objective

Because overall management of the Refuge Complex will emphasize active habitat management, native habitat restoration, and addressing threats to ecosystem health, educational and interpretive programs and materials will focus on managed and restored habitats, management and restoration methodology, and the fish, wildlife and plant species they support. Educating visitors about the importance of our

coastal resources and on the role of the Refuge Complex in managing, restoring and maintaining native biological diversity will lead to support and responsible stewardship action. Many excellent opportunities exist to expand partnerships with local school districts to incorporate environmental education in their science curricula.

Strategies

New facility and program development will focus on partnership opportunities with local, county and state agencies, industry, and with organizations such as our Refuge Friends groups. Partnerships with volunteers and school districts will be expanded in support of the environmental education program.

Throughout the Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Construct Refuge Complex Administrative Headquarters and Wildlife Interpretive Center in Chambers County.
- **Strategy 2** - Maintain existing facilities which support environmental education and interpretation including the Anahuac NWR Visitor Information Station, roads, parking areas, trails, interpretive signs, observation platforms and boardwalks.
- **Strategy 3** - Through a partnership with the Friends of Anahuac Refuge, refuge volunteers and local school districts, provide an environmental education program on Anahuac NWR for kindergarten through fifth grade students. Specific curricula have been developed for each grade. Over 1,000 students annually are taught during field trips to the refuge and through an in-school reading program.
- **Strategy 4** - Provide guided tours and interpreted nature walks for visitors on Anahuac NWR in partnership with the Friends of Anahuac Refuge and volunteers.
- **Strategy 5** - Host annual education special events including the Youth Waterfowl Expo, Marsh Madness and National Fishing Week celebration, and participate in educational activities at local and regional festivals including GatorFest, Rice Festival, and the Texas Wildlife Expo.
- **Strategy 6** - Produce a video detailing the natural resources of the Chenier Plain region and the role of the Refuge Complex in conserving these resources. (Anahuac NWR RONS Project #98040 - Produce educational audio-visual presentations)
- **Strategy 7** - Revise the two refuge general brochures and websites to detail each Refuge's role in managing and restoring native habitats and fish, wildlife, and plants. (Anahuac NWR RONS Project #98037 - Enhance educational and interpretive programs)
- **Strategy 8** - Develop programs on wildflowers, butterflies, mammals and reptiles and amphibians found on the Refuge Complex. (Anahuac NWR RONS Project #98043 - Expand environmental education program)
- **Strategy 9** – Develop step-down Wildlife Observation and Photography/Environmental Education and Interpretation plans (as part of the Refuge Complex Visitor Services Plan) for the Anahuac, McFaddin and Texas Point NWRs.

1-5 Years - Anahuac NWR:

- **Strategy 1** - Develop interpretive exhibits for the butterfly habitat and native prairie demonstration site, including exhibits which highlight native butterflies and native plants which provide important habitat for butterflies. (Anahuac NWR RONS Project #03000 - Develop and interpret butterfly habitat)

- **Strategy 2** - Develop interpretive exhibits on waterfowl and waterfowl management for the East Unit Hunter Check Station. (Anahuac NWR RONS Project #00005- Develop interpretive exhibits for WCS)
- **Strategy 3** - Complete interpretive facility development in the Visitor Information Station including: 1) two interactive multi-media audio-visual programs; 2) digital imaging displays of coastal habitats and fish and wildlife species representing all four seasons; and 3) a hanging display of life-sized marsh and water bird carvings.
- **Strategy 4** - Initiate weekly interpretive walks during spring, focusing on bird and butterfly identification and habitat use.
- **Strategy 5** - Develop and produce a “Children’s Check List” of common refuge plants, animals and fish.

6-10 Years - Anahuac NWR:

- **Strategy 1** - Develop a self-guided radio interpretive program for the Willows- Shoveler Pond - Frozen Point auto tour route. (Anahuac NWR RONS Project #98036 - Develop tour route radio program and interpretive exhibits).
- **Strategy 2** - Develop a brochure on the role of fire in marsh and prairie ecology and its use as a management tool on the Refuge Complex. (Anahuac NWR RONS Project #98037 - Enhance educational and interpretive programs)
- **Strategy 3** - Construct an interpretive kiosk at the East Bay Bayou Tract trailhead, and produce self-guided brochure/trail guide for East Bay Bayou Tract.
- **Strategy 4** - Conduct naturalist-led interpretive walks during fall and winter, focusing on wintering waterfowl and the habitats they utilize.
- **Strategy 5** - Develop 4 mobile interpretive displays on 1) habitat management practices for waterfowl, shorebirds, and other wetland-dependent migratory birds; 2) native coastal prairie and prairie restoration; 3) coastal woodlots; and 4) fire ecology. (Anahuac NWR RONS Project #98036 - Develop tour route radio program and interpretive exhibits)
- **Strategy 6** - Develop interpretive signs on native habitats including coastal wetlands, coastal prairie, and coastal woodlots and the wildlife species they support, and strategically place throughout the Refuge. (Anahuac NWR RONS Project #03001 - Develop interpretive displays)
- **Strategy 7** - Develop interpretive exhibits on wetland and upland habitat management practices including prescribed burning, controlled grazing, water management and exotic species control and strategically place throughout the Refuge. (Anahuac NWR RONS Project #03001 - Develop interpretive displays)
- **Strategy 8** - Develop interpretive signs for the Oyster Bayou Moist Soil Unit overlooks, emphasizing waterfowl and shorebird ecology and moist soil management. (Anahuac NWR RONS Project #03001- Develop interpretive displays)

11-15 Years - Anahuac NWR:

- **Strategy 1** - Develop an advanced independent projects program, working with local scouting and 4-H groups.

- **Strategy 2** - Develop an educational activity for middle school and high school students describing neotropical migratory bird migration and the importance of protecting breeding, wintering and stopover habitat. The activity would include a classroom session followed by a field trip to the Refuge during spring migration.
- **Strategy 3** - Install a microwave video camera in the field to project images of “real time” nature back to the Visitor Information Station and/or the Friends of Anahuac Refuge Web page.

1-5 Years - McFaddin and Texas Point NWRs:

- **Strategy 1** - Develop and initiate an on-refuge Environmental Education program for Sabine Pass schools and students.
- **Strategy 2** - Install interpretive kiosks and signs on McFaddin and Texas Point NWRs to interpret coastal marsh and coastal woodlot habitats and native fish and wildlife resources.
- **Strategy 3** - Develop and install interpretive exhibits in the new McFaddin NWR headquarters office.

6-10 Years – McFaddin and Texas Point NWRs:

- **Strategy 1** - Develop interpretive exhibits on waterfowl and waterfowl management for the McFaddin NWR check station.

Objective E. Management of Beach Uses on McFaddin NWR. The objective is to protect public safety and natural resources along the Gulf of Mexico shoreline within the Refuge.

Rationale for the Objective

The beaches along the Gulf of Mexico on and adjacent to the McFaddin NWR support recreational uses including surf fishing, swimming, sunbathing, wildlife observation and camping. The beaches are considered an area of joint Federal and State of Texas jurisdiction. The beach inland of the Mean High Water line lies within the Refuge. Motorized vehicular traffic occurs on the beach from the vegetation line seaward to mean low tide line, on the public beach easement established under the State of Texas “Open Beaches Act” (Texas Natural Resources Code, Chapter 61: Use and Maintenance of Public Beaches).

Strategies

Throughout the Life of the Plan – McFaddin and Texas Point NWRs:

- **Strategy 1** - Continue and expand law enforcement activities to protect public safety and natural resources.
- **Strategy 2** - Expand coordination with the Texas General Land Office and county agencies to enhance protection of public safety and natural resources on Gulf of Mexico beaches.

Objective F. Community Outreach and Partnerships

Objective F-1. Community Outreach. The objective is to promote conservation of natural resources on a landscape scale by working effectively with partners in support of USFWS management and public use programs on the Refuge Complex and by supporting community-based conservation and conservation education and development of nature tourism opportunities.

Rationale for the Objective

Partnerships with the Friends of Anahuac Refuge and the McFaddin and Texas Point Refuges Alliance, and with conservation organizations including the Galveston Bay Foundation, Ducks Unlimited, the Galveston Bay Estuary Program and local Audubon chapters have been highly successful in supporting a variety of refuge management programs and activities. Refuge volunteers currently provide over 10,000 hours of service annually. Excellent opportunities exist for integrating USFWS programs into community-based conservation, conservation education and development of nature tourism opportunities.

Strategies

Throughout Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Work with the Friends of Anahuac Refuge and the McFaddin and Texas Point Refuges Alliance to increase volunteerism and other partnership endeavors (Anahuac NWR RONS Project #0004 - Expand volunteer program)
- **Strategy 2** - Expand coordination with county agencies, Chambers of Commerce and other organizations and others to promote conservation and nature tourism opportunities through mutual information sharing, development of promotional materials, and other partnership endeavors.
- **Strategy 3** - Expand coordination with conservation organizations and other state and federal agencies and develop additional partnership programs.
- **Strategy 4** - Develop a "Refuge Update" news article for publication in local newspapers.

Objective F-2. Private Lands Partnerships. By Year 15 of the CCP's implementation, 1,500 acres of coastal marsh and prairie wetlands habitat, 500 acres of prairie and 10 acres of woodlot habitat on private lands in the Texas Chenier Plain region will be enhanced or restored through coordination with interested private landowners and the use of USFWS private lands programs.

Rationale for the Objective

Many private lands in the region are skillfully managed to provide habitat for wintering waterfowl and other migratory birds. Excellent opportunities and much interest among landowners exist to enhance, restore and manage wetland, grassland and woodlot habitats on private lands. A variety of private lands programs are available to private landowners to enhance fish and wildlife habitat.

Strategies

Note: The Strategies below are supported by the following RONS Project: Anahuac NWR RONS Project #02002 - Hold Management Workshops for Private Landowners.

Throughout Life of the CCP and Refuge Complex-wide:

- **Strategy 1** - Provide technical assistance to private landowners in Chambers, Jefferson and Galveston counties wishing to enhance wetland, grassland and woodland habitats through active management and restoration.
- **Strategy 2** - Expand coordination with private landowners in Chambers, Jefferson and Galveston counties to develop habitat enhancement and restoration projects the USFWS' Partners for Fish and Wildlife Program, and through other private lands programs such as the Texas Prairie Wetlands Project (a partnership program sponsored by Ducks Unlimited, Texas Parks and

Wildlife Department, the Natural Resource Conservation Service, and the U.S. Fish and Wildlife Service).

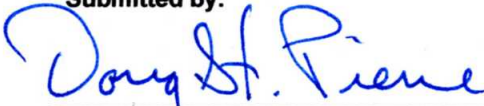
- **Strategy 3** - Hold three on-refuge workshops for private landowners and other agency personnel to demonstrate marsh management and restoration, moist soil management, prairie and woodlot restoration, and to highlight available USFWS private lands programs and grant opportunities.

COMPREHENSIVE CONSERVATION PLAN APPROVAL

for
Texas Chenier Plain National Wildlife Refuge Complex
located in
Galveston, Chambers, & Jefferson Counties, Texas
U.S. Fish and Wildlife Service, Region 2
May 2008

The attached Comprehensive Conservation Plan for the Texas Chenier Plain National Wildlife Refuge Complex has been prepared by Regional Office and Refuge Staff. The contents and format are found to be in compliance with Service Policy on the preparation of Comprehensive Conservation Plans, and is hereby submitted for approval.

Submitted by:



Doug St. Pierre
Senior Natural Resource Planner

4-4-08

Date

Approved by:

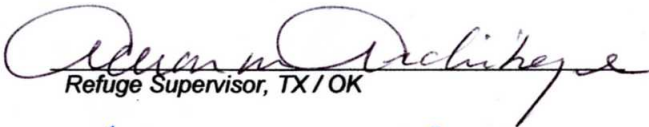


Tim Cooper
Refuge Complex Manager

4-14-08

Date

Concurrence by:


Refuge Supervisor, TX / OK

4/30/08

Date


Regional Chief, NWR System, Region 2

5-5-08

Date



Regional Director, Region 2

5/6/08

Date

APPENDIX E: COMPATIBILITY DETERMINATIONS FOR ANAHUAC, MCFADDIN, AND TEXAS POINT NWRS

COMPATIBILITY DETERMINATION: ANAHUAC NWR - WATERFOWL HUNTING

Use: Waterfowl Hunting
Refuge Name: Anahuac National Wildlife Refuge
County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR or Refuge) proposes to continue to provide waterfowl hunting opportunities (for ducks, geese, and coots) in designated areas that are compatible with Refuge purposes. Hunting is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Waterfowl hunting is a long-standing traditional use on and around Anahuac NWR (McNeir 1956, Jackson 1961, Lagow 1970). This

Compatibility Determination considers continuation of waterfowl hunting on the Refuge, and includes consideration of modifications to the Refuge hunting program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Waterfowl hunting on Anahuac NWR is supported by several modes of access, including motorized vehicles, motorized and non-motorized boating, bicycling, and walking. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with waterfowl hunting.

Opportunities for waterfowl hunting on Anahuac NWR will be available within the season set by Texas Parks and Wildlife Department in compliance with annually published regulations. Designated hunting areas will be open during established State waterfowl seasons, with the exception that hunting for ducks and coots will not be allowed on the Refuge until the last Saturday in October (not including the September teal and youth-only seasons). If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date.

In addition, if the light goose conservation order is in effect, these season dates may be reduced on the Refuge in accordance with the timing of the departure of geese from the area, typically late February. All applicable State and Federal regulations are enforced.

The waterfowl hunting season generally falls within the period of September through February. Traditionally, the hunting season on the Texas coast begins in September with the early teal season. The regular waterfowl season follows, often beginning in late October and running through January. The light goose conservation order typically begins at the end of the regular waterfowl season in January and runs through March.

Three different hunt units are open to waterfowl hunting on Anahuac NWR (Figure E.1), including the Pace Tract (1,500 acres), and portions of the East Unit (10,200 acres) and Middleton Tract (1,200 acres). These three hunt units total 12,900 acres. These units occur primarily in coastal marsh habitats, including saline, brackish and intermediate marshes. In addition to coastal marsh habitats, rice fields, moist-soil units and fresh water reservoirs are open to waterfowl hunting on the East Unit hunt area.

The three hunt units are open on different days of the week to provide hunting opportunities throughout the week, as well as periods of rest for waterfowl. The Pace Tract will be open daily during the early teal season and the regular waterfowl season. The East Unit will be open on Saturdays and Sundays during the early teal season, and on Saturdays, Sundays and Tuesdays during the regular waterfowl season. The Middleton Tract will be open daily during the early teal season and on Saturdays, Sundays, and Wednesdays during the regular waterfowl season. All hunt units are closed on

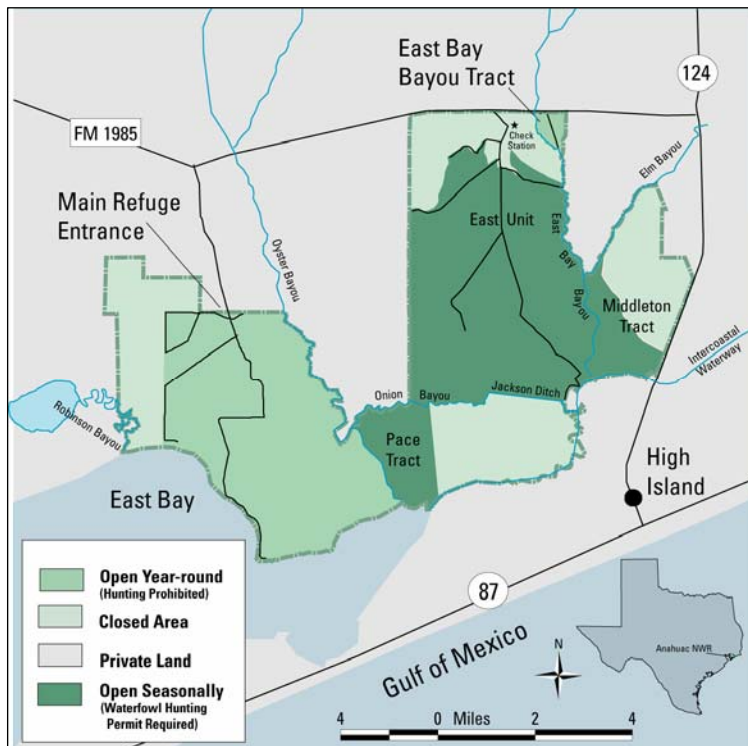


Figure E.1. Location of waterfowl hunt units on Anahuac NWR.

Thanksgiving, Christmas and New Year's Day. These units are open for waterfowl hunting only, and are closed to the public at other times of the year.

Hunters may enter Refuge hunt units no earlier than 4:00 am. All hunts are morning-only hunts. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm.

A waterfowl hunting permit must be signed and in the possession of the hunter while hunting on any of the Refuge hunt units. This permit is available at no charge and serves to inform the hunter of Refuge-specific regulations. In addition, a daily or annual user fee is required for hunting the East Unit during the regular waterfowl season. In fiscal year 2002, approximately 4,800 hunters utilized the Refuge for waterfowl hunting.

Waterfowl hunting is a long and established tradition in the coastal marshes of southeast Texas, and occurred on Refuge lands long before the establishment of the Refuge (McNeir 1956, Jackson 1961, Lagow 1970). The Refuge first opened to public waterfowl hunting in 1980, after the purchase of the Pace Tract in 1979. After additional acquisitions, portions of the East Unit, and then the Middleton Tract, were also opened to public waterfowl hunting. Today, 40% of Anahuac NWR is open for waterfowl hunting, the maximum allowable limit permitted under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

Additional public waterfowl hunting opportunities exist in the area at the State managed J.D. Murphree Wildlife Management Area, the Wallisville Lake Project managed by the U.S. Army Corps of Engineers, and the McFaddin and Texas Point National Wildlife Refuges managed by the U.S. Fish and Wildlife Service. 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.

Availability of Resources:

Costs to administer the hunt program will mostly be salaries and facilities maintenance. This would include staffing the East Unit waterfowl check station throughout the season to issue permits, collect fees, provide information and collect harvest data. A staffed check station improves visitor services and the quality of a visitor's experience by providing orientation and guidance. Additionally, valuable biological data on migratory birds are collected by Refuge staff at waterfowl check stations. Other costs to administer the program includes law enforcement throughout the season by refuge law enforcement staff, as well as sign posting, development and publishing of refuge specific regulations and permits, and responding to public inquiries and requests for permits. Existing facilities requiring maintenance and upkeep include the accessible hunt blind and boardwalk, the waterfowl check station, parking areas, crosswalks, bridges, portable restrooms, roads, and boat ramps and boat rollers. The length of the season as determined annually by the State may result in an increase or decrease in the number of staff days required to administer the program.

The daily or annual user fees for waterfowl hunting on the East Unit would assist with the costs associated with running the hunt program, however as previous years have demonstrated, these funds are insufficient to cover all costs associated with the program. Base funding will also be needed to manage the program. Volunteer workdays will continue to be organized in order to help prepare the hunt units for the upcoming seasons.

In addition to season length, hunter trends, either up or down, will result in an increase or decrease in staffing needed. If hunter use considerably declines on the Refuge, along with associated fees, the Refuge may need to consider alternatives for staffing the check station. Though not preferred, a self-registering procedure may be developed in response to such trends.

Anticipated Impacts of Use:

The potential impacts of the Anahuac NWR waterfowl hunt program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered (T&E) species known to use the Refuge hunt units or areas adjacent to hunt units during waterfowl season include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (*Alligator mississippiensis*, Threatened). Waterfowl hunting activities will not adversely impact any Threatened or Endangered species occurring on the Refuge. Bald eagles are observed only occasionally on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in refuge sanctuary areas. Non-toxic shot regulations are actively enforced on the Refuge, and no cases of lead poisoning in eagles scavenging on waterfowl carcasses have been documented on the Refuge. Brown Pelicans do not generally utilize habitats found on refuge hunt units, but may be present in habitats adjacent to hunt units. Brown pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay and the GIWW. Minor disturbance impacts to brown pelicans may occur from hunters traveling to the Refuge by boat on East Bay and the GIWW. The GIWW is heavily used by both commercial and recreational boat traffic, and brown pelicans are habituated to boat traffic. These T&E avian species do not nest on the Refuge, their presence is transient in nature, and they are highly mobile and readily able to move to undisturbed areas. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The refuge waterfowl hunt program does not directly or indirectly impact alligators.

Habitats: The greatest potential for impacts to vegetation resources and habitats on the Refuge likely comes from motorized boating activities. Many Refuge hunt areas are accessible only or primarily by motorized boat. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submerged aquatic vegetation.

Foot traffic in areas open to hunting can lead to vegetation trampling, and in heavy use areas, cause plant mortality. Some vegetation trampling and trailing from hunter foot traffic occurs in marsh habitats in hunt areas, although these impacts tend to be short-term.

These impacts are expected to be localized and minimal. Regulations, including horsepower restrictions and area closures to motorized boating (i.e. no prop zones) are used on the Refuge to protect wetland habitats and public safety.

Migratory Birds and Other Biological Resources: The most direct effect of hunting on the Refuge is the mortality of harvested waterfowl species resulting from hunting activities. Regulations governing harvest in states in the Central and Mississippi Flyways are developed annually through the Federal framework process for harvest of migratory birds in the U.S. This process is designed to ensure that viable waterfowl populations are sustained over the long-term. Overall, harvest on the Refuge, and cumulatively on all national wildlife refuges open to migratory bird hunting, constitutes a very small percentage of the overall harvest of migratory birds in these Flyways. The continuation of the waterfowl hunting program on the Refuge under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP (USFWS 2007) will not have any measurable effect on overall populations of hunted waterfowl species and the long-term viability of these populations.

Harvest statistics for the East Unit hunt area of the Anahuac NWR are collected annually through the operation of hunter check station. Annual harvest statistics for the years 2000-2007 are presented in Table 1 below. These data do not represent total harvest on the Refuge, as harvest information is not

collected from hunters utilizing the Pact Tract and Middleton Tract refuge hunt units. Green-winged teal, gadwall, blue-winged teal and Northern shoveler are the principal duck species harvested on the Refuge. Snow geese and Greater white-fronted geese comprise the majority of the refuge goose harvest.

Table E-1. Waterfowl Harvest Numbers, East Unit of Anahuac NWR, 1999-2006.*

*Data collected at the Anahuac NWR East Unit Hunter Check Station.

Species	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007
Black-bellied Whistling-Duck	0	0	0	0	0	0	0	35
Fulvous Whistling-Duck	1	0	4	8	1	0	1	5
Greater White-Fronted Goose	54	38	41	10	11	53	21	38
Snow Goose ¹	159	79	84	139	46	55	91	136
Ross's Goose	15	2	5	2	1*	5**	3	8
Canada/Cackling Goose	6	2	1	1	2	1	0	5
Unidentified Goose	0	0	0	0	2*	0	0	0
Wood Duck	18	15	11	7	7	2	3	9
Gadwall	373	234	365	120	238	272	247	115
American Wigeon	43	57	44	14	36	36	25	12
Mallard	91	98	50	35	42	27	58	67
Mottled Duck	84	90	46	64	76	83	52	106
Blue-winged Teal	74	177	123	186	107	91	98	180
Cinnamon Teal	2	0	1	0	5	0	0	1
Northern Shoveler	143	356	116	59	85	96	163	141
Northern Pintail	36	34	44	21	14	6	31	37
Green-winged Teal	488	477	212	219	219	244	371	287
Canvasback	1	3	0	0	0	1	3	1
Redhead	3	11	3	1	4	1	5	6
Ring-necked Duck	5	19	58	13	8	11	11	12
Greater Scaup	0	0	0	0	1	0	3	1
Lesser Scaup	0	0	0	0	28	32	195	61
Scaup species	6	103	42	71	0	0	0	0
Surf Scoter	0	0	0	1	0	0	0	0
Bufflehead	0	0	1	0	0	0	1	3
Goldeneye species	1	1	7	0	1	2	0	6
Hooded Merganser	2	8	3	2	2	5	2	2
Red-breasted Merganser	0	0	0	1	0	0	0	0
Masked Duck	0	0	0	0	0	0	0	1
Ruddy Duck	0	2	2	0	0	0	4	3
American Coot	7	6	5	2	2	0	0	0
Total Birds	1612	1812	1268	976	938	1023	1388	1278

¹ Includes snow geese harvested during the light goose conservation order.

* Geese harvested during the light goose conservation order.

** Includes two geese harvested during light goose conservation order.

Many studies have documented the effects of hunting intensity on the number of birds utilizing an area (Madsen *et al.* 1992 as cited by Fox and Madsen 1997). This study demonstrated that relatively light hunting pressure can reduce waterfowl abundance in hunted areas. Distribution and habitat use, feeding patterns, and the nutritional status of waterfowl have also been shown to be affected by hunting activities. Hunting activity can cause birds to alter habitat use, change feeding locations (Madsen 1995), feed more at night (Thornburg 1973, Morton *et al.* 1989) and reduce the amount of time spent feeding (Korschgen *et al.* 1985, Madsen 1995). Collectively, these changes in behavior have the potential to adversely impact the nutritional status of waterfowl (Bélanger and Bédard 1995).

Hunting may have a more significant impact on resident mottled ducks. Pair bonds for mottled ducks are established earlier than northern nesting birds and disturbance caused by hunting may disrupt the reproductive cycle for this species. Additionally, opening the regular waterfowl season before the arrival of migrating ducks from northern breeding areas allows for disproportionate harvest of resident birds, primarily Mottled Ducks. Refuge-specific regulations prohibit the opening of the general waterfowl season on the Refuge any earlier than the third Saturday in October in order to prevent this impact.

Monthly aerial surveys of wintering waterfowl on the Refuge have documented the disproportionate use of established sanctuary areas by waterfowl, as compared to the areas open to hunting. This further supports the above studies and indicates that hunting affects the overall distribution of wintering waterfowl on the Refuge. It has been shown that sanctuary areas on the wintering grounds are effective in maintaining local waterfowl populations in a landscape subject to hunting pressure (Bellrose 1954, Madsen 1998). Heitmeyer and Raveling (1988) found that waterfowl used sanctuaries during the day and local rice fields at night. Similarly, Fleskes *et al.*, (2005) found northern pintail used areas closed to hunting during the day and dispersed throughout the area at night. These data indicate that while sanctuaries are effective in maintaining local waterfowl populations through the hunting season, birds must disperse at night to feed.

Sanctuary areas tend to support greater numbers of waterfowl the longer they have been established. Bellrose (1954) found that traditional sanctuary areas support higher populations of migrating ducks than newly established sanctuary areas. Similarly, Madsen (1998) found that it took two to six years between the creation of sanctuary areas and the time when peak numbers of dabbling ducks were reached. These data indicate that traditional, long-term sanctuary areas are more valuable to maintaining local waterfowl populations than sanctuary areas that shift from year to year. Presumably, providing waterfowl with predictable undisturbed sanctuary areas increases the ability of birds to meet the obligations of their annual cycle. Waterfowl undergo considerable physiological demands during winter. Heitmeyer (1988) estimated that prebasic molt in female mallards required an additional three grams per day of protein over base metabolic rates. These demands approach the estimated five grams per day associated with reproduction. Pair formation for most North American waterfowl takes place away from the breeding grounds. Waterfowl must accumulate endogenous energy reserves to meet the demands of courtship (Afton and Saylor *in* Baldassarre and Bolen 1994). Baldassarre and Bolen (1994) proposed that birds that do not accumulate energy reserves may have less time and energy at their disposal to initiate courtship and/or may be unable to maintain previously established pair bonds. Clearly, birds must meet high energy demands to successfully fulfill critical wintering components of their annual cycle. Further, Heitmeyer and Fredrickson (1981) build a scenario where endogenous reserves established on wintering grounds return mallards to breeding areas in better condition to begin nesting, leading to larger clutch sizes and earlier nests, which tend to be more successful. Providing sanctuary areas of adequate size adjacent to quality feeding areas may contribute to the ability of birds to meet the physiological demands required during winter and possibly the subsequent nesting cycle.

The size, location and habitat quality of sanctuary areas on the Refuge remains critically important to ensure that migrating and wintering populations of waterfowl maintain sound nutritional and physiological status. Overall, it is expected that the maintenance of traditional sanctuary areas on the Refuge adequately mitigates for impacts from hunting activities. In years of particularly poor habitat quality due to climatic extremes or tidal flooding from tropical disturbances, however, it is possible that hunting activities would result in reduced abundance of wintering waterfowl on the Refuge.

Although the impacts of waterfowl hunting on wetland-dependent migratory and resident birds which are not hunted is likely less than for waterfowl, studies have demonstrated that hunting (including accessing hunt areas) does affect abundance and distribution of these other avian species. The noise associated with shooting likely reduces habitat utilization by shorebirds, wading birds, other marsh and waterbirds, and landbirds using wetland habitats within hunt areas, at least while hunting is occurring.

Incidental take of other wildlife species, either illegally or unintentionally, may occur with any consumptive use program. At current and anticipated public use levels and based on past history, incidental take is

expected to be small and will not directly or cumulatively impact current or future populations of wildlife on the Refuge.

Means of access to and within Refuge hunt areas include motorized boating (primarily in Oyster, Onion and East Bay bayous and East Galveston Bay), non-motorized boating, motorized vehicles, bicycling, and walking. Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Boat use on the Refuge occurs primarily in bayous, canals and ditches, limiting disturbance impacts to these narrow corridors. The majority of the hunt areas therefore are not impacted by boating activity. In addition, a variety of regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, prohibition of airboat and all-terrain vehicle use, and establishment of areas in which only non-motorized boat access is allowed. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Other Wildlife-dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Waterfowl hunting has occurred on the Refuge since 1980, along with other these other recreational uses. Few conflicts among users of the Refuge have been documented in relation to waterfowl hunting. The separation of hunt units from portions of the Refuge open to wildlife observation and photography, fishing, environmental education and interpretation minimizes potential conflicts and reduces safety issues. Hunt units are closed to other public uses during the hunting season and during the remainder of the year once the hunting season has closed. The other priority wildlife-dependent recreational uses are offered on portions of the Refuge that are more easily accessible to the public via refuge roads and trails, enhancing the quality of these opportunities for the public.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To reduce the impact of hunting on the resident Mottled Duck, modifications may be placed on opening dates for the regular waterfowl season. Season dates on the Refuge will be concurrent with Texas Parks

and Wildlife Department for the September teal season, youth-only season, and duck and coot regular season in the Texas South Zone, and goose regular season in the Texas East Zone, with the exception that hunting for duck (not including the September teal and youth-only seasons) and coot will not be allowed on the Refuge until the last Saturday in October. If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date. All waterfowl hunters must follow the stipulations set forth in the waterfowl hunting regulations published annually by the Refuge.

Portions of the East Unit will be open for waterfowl hunting on Saturdays and Sundays of the early teal season, and three days a week (Tuesdays, Saturdays and Sundays) of the regular waterfowl season. Portions of the Middleton Tract will be open for waterfowl hunting daily during the early teal season and three days a week during the regular waterfowl season (Wednesdays, Saturdays and Sundays). The Pace Tract will be open daily during the early teal and regular waterfowl seasons.

These units will be open for waterfowl hunting only, and are closed to public access at other times of the year. All hunts will be morning-only hunts. Hunters may enter Refuge hunt units no earlier than 4:00 am. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm. All other refuge units are closed to waterfowl hunting. Long-term, traditional sanctuary areas will remain as sanctuary, with no public access permitted in the unit. Motorized boats are allowed in the Pace Tract, and the ponds located off of Jackson Ditch on the East Unit. Motorized boats on the Middleton Tract are restricted to 25 horsepower or less. Only non-motorized access (via boat or walk-in) is allowed on the East Unit (with the exception of the ponds located off of Jackson Ditch). Bicycles are permitted only on roads open to motorized vehicles and designated levees.

On inland waters of Refuge hunt areas open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of Refuge hunt units will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on Oyster Bayou, Onion Bayou and East Bay Bayou. This grace period of 5 years is aimed to provide those hunters currently using boats with a horsepower greater than 25 hp ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Airboats, marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

A limited number of parties will be permitted to enter the East Unit through the check station by vehicle. No limits are currently in place for numbers of hunters or parties on the Pace and Middleton Tracts. Both the Pace Tract and Middleton Tract are accessed primarily by boat. The remoteness and difficulty accessing these tracts have naturally limited the number of parties hunting in these units. If hunter use in these units increases substantially, thereby negatively impacting the quality of the hunt, an alternative system would be devised to reduce the number of parties using these units.

The use of retrieving dogs will continue to be allowed and encouraged in all areas open to waterfowl hunting for the conservation of downed birds. Dogs must be under the control of handlers at all times.

The Refuge will maintain an active law enforcement presence in an effort to maximize compliance with State and Federal waterfowl hunting regulations. Annual monitoring of hunter use and impacts will be implemented. The information gathered will be used to review and possibly revise hunting regulations to enhance the quality and safety of the Refuge's hunting program, and to ensure that waterfowl hunting activities will continue to be compatible with Refuge purposes and the mission of the National Wildlife Refuge System.

Justification:

The Anahuac NWR waterfowl hunting program is determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. The Refuge provides quality waterfowl habitats for thousands of migratory birds annually. Migratory bird populations and harvest parameters are monitored and managed on a flyway basis and are designed to ensure the long-term sustainability of populations. Additionally, the hunt program on the Refuge is specifically designed to provide quality public hunting opportunities while minimizing potential impacts to local populations of migratory birds and their habitats.

Refuge-specific regulations are in place to minimize potential adverse impacts from hunting-related disturbance to wildlife and habitats. Regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, prohibition of airboat and all-terrain vehicle use, and establishment of areas in which only non-motorized boat access is allowed. Of critical importance is the USFWS' ability to manage and maintain traditional sanctuary areas. The Refuge waterfowl hunt program is also managed in such a way to minimize conflicts with other compatible recreational uses and management programs. The Refuge will continue to monitor hunter use, compliance with rules and regulations, and impacts to waterfowl and other wildlife and use this information to adjust the waterfowl hunt program as necessary to protect Refuge resources.

Hunting is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Waterfowl hunting is a long-standing traditional use on and around Anahuac NWR, and has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby ultimately contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andy Louange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Spier 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: ANAHUAC NWR - DOVE HUNTING

Use: Dove Hunting
Refuge Name: Anahuac National Wildlife Refuge
County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "..." the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR or Refuge) proposes to provide dove hunting opportunities, compatible with Refuge purposes, in designated areas. Hunting is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Dove hunting is a long-standing traditional use in southeast Texas. This Compatibility Determination considers the establishment of dove hunting on the Refuge as proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP)(USFWS 2007).

Dove hunting on Anahuac NWR will be administered through a Cooperative Agreement with Texas Parks and Wildlife Department and their "Short Term Public Hunting Lease Program." Both mourning dove and white-winged dove occur on the Refuge, with mourning dove by far the more prevalent. Opportunities for dove hunting on Anahuac NWR would be available within the State designated season. The Refuge falls within the Texas South Dove Hunting Zone. Dove hunting season in the South Zone generally falls within the period of September to January (the 2006-2007 dove season in the South Zone was open from September 22 through November 16, 2006 and December 26, 2006 through January 12, 2007). Public hunting of dove would be allowed on designated days and times as a "Youth/Adult" hunt area on a designated portion(s) of the Refuge. A "Youth/Adult" hunt program requires that all hunters 18 years of age and older be accompanied by a youth hunter 17 years of age or younger.

Areas open to dove hunting on the Refuge will be determined annually and will be described in the Texas Parks and Wildlife Department Public Dove Hunting Areas Supplement to the Texas Public Hunting Lands Map Booklet. Areas open to dove hunting on the refuge will be in portions of the Refuge associated with or adjacent to lands managed through the Refuge's cooperative farming (rice) program. Means of access to the hunt area(s) will be by foot or motorized vehicle only.

Availability of Resources:

Costs to administer the hunt program will mostly be salaries. This would primarily involve law enforcement throughout the season by Refuge law enforcement staff. Through the Cooperative Agreement with the Texas Parks and Wildlife Department, TPWD staff will provide signage for designated dove hunt areas, and assist in conducting law enforcement activities.

Anticipated Impacts of Use:

The potential impacts of the Anahuac NWR dove hunt program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered (T&E) species known to use the Refuge hunt units or areas adjacent to hunt units include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (*Alligator mississippiensis*, Threatened). Of these species, only the American alligator occurs in or adjacent to areas which would be open for dove hunting. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The refuge dove hunting program would not directly or indirectly impact alligators. They typically feed on wounded or sick waterfowl, and are usually associated with large concentrations of wintering waterfowl that occur in refuge sanctuary areas. Non-toxic shot regulations are actively enforced on the Refuge, and no cases of lead poisoning in eagles scavenging on waterfowl carcasses have been documented on the Refuge. Brown pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay and the GIWW. These T&E avian species do not nest on the Refuge, their presence is transient in nature, and they are highly mobile and readily able to move to undisturbed areas. Dove hunting activities will not adversely impact any Threatened or Endangered species occurring on the Refuge.

Habitats: Foot traffic in areas open to hunting can lead to vegetation trampling, and in heavy use areas, cause plant mortality. Some vegetation trampling and trailing from hunter foot traffic would occur in designated dove hunt areas, although these impacts would be minimal and short-term.

Migratory Birds and Other Biological Resources: The most direct effect of hunting on the Refuge is the mortality of harvested species resulting from hunting activities. Regulations governing dove harvest in the Central and Mississippi Flyways and the State of Texas are developed annually through the Federal framework process for harvest of migratory birds in the U.S. This process is designed to ensure that viable populations are sustained over the long-term. Anticipated annual dove harvest on the Refuge is expected to number fewer than 250 birds, which represents an extremely small percentage of overall

harvest in Texas and the Central Flyway. Cumulatively, dove harvest on all national wildlife refuges open to dove hunting in Texas and the Central Flyway represents a very small percentage of overall harvest of these species. The establishment of a dove hunting program on the Refuge will not have any measurable effect on overall dove populations and the long-term viability of these populations.

Incidental take of other wildlife species, either illegally or unintentionally, may occur with any consumptive use program. Incidental take is expected to be small and will not directly or cumulatively impact current or future populations of wildlife on the Refuge.

Although the impacts of dove hunting on birds which are not hunted is likely less than for dove, studies have demonstrated that hunting (including accessing hunt areas) does affect abundance and distribution of other avian species. The noise associated with shooting likely reduces habitat utilization by birds using upland habitats within hunt areas, at least while hunting is occurring.

Means of access to and within Refuge hunt areas may include motorized vehicles and walking. Vehicles on roads and walking have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Walking tends to displace birds and can cause localized declines in species richness and abundance (Riffell *et al.* 1996). Refuge-specific regulations prohibit off-road vehicular travel and all-terrain vehicle use. Areas open for dove hunting will be located so as to minimize impacts to waterfowl and other migratory birds using adjacent managed wetlands.

Other Wildlife-dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Waterfowl hunting has occurred on the Refuge since 1980, and few conflicts among between hunters and other users of the Refuge have been documented. No conflicts are expected between dove hunters and other refuge users. The separation of hunt units from portions of the Refuge open to wildlife observation and photography, fishing, environmental education and interpretation minimizes potential conflicts and reduces safety issues. Hunt units are closed to other public uses during the hunting season and during the remainder of the year once the hunting season has closed. The other priority wildlife-dependent recreational uses are offered on portions of the Refuge that are more easily accessible to the public via refuge roads and trails, enhancing the quality of these opportunities for the public.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Dove hunting on Anahuac NWR will be administered through a Cooperative Agreement with the Texas Parks and Wildlife Department and their "Short Term Public Hunting Lease Program." Opportunities for dove hunting on Anahuac NWR would be available within the season set by Texas Parks and Wildlife Department. Public hunting of dove would be allowed on designated days and times as a "Youth/Adult" hunt area on a designated portion(s) of the Refuge.

Dove hunt areas will be determined annually and described in the Texas Parks and Wildlife Department Public Dove Hunting Areas Supplement to the Texas Public Hunting Lands Map Booklet. Location of designated dove hunt areas will be chosen so as to minimize disturbance impacts to waterfowl and other avian species utilizing managed rice field and moist soil habitats.

Means of access to the hunt area(s) will be by foot or motorized vehicle only. All-terrain vehicles are prohibited on the Refuge.

Only non-toxic shot may be used.

The use of retrieving dogs will be allowed and encouraged in all areas open to dove hunting for the conservation of downed birds. Dogs must be under the control of handlers at all times.

The Refuge will maintain an active law enforcement presence in an effort to maximize compliance with State and Federal hunting regulations. Annual monitoring of hunter use and impacts will be implemented. The information gathered will be used to review and possibly revise hunting regulations to enhance the quality and safety of the Refuge's hunting program, and to ensure that hunting activities will continue to be compatible with Refuge purposes and the mission of the National Wildlife Refuge System.

Justification:

The Anahuac NWR proposed dove hunting program is determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. Migratory bird populations and harvest parameters are monitored and managed on a flyway basis and are designed to ensure the long-term sustainability of populations. Additionally, the hunt program on the Refuge will be specifically designed to provide quality public hunting opportunities while minimizing potential impacts to local populations of migratory birds and their habitats.

Regulations govern means of access to hunt area(s), including prohibition of all-terrain vehicle use. The Refuge dove hunt program will also be managed in such a way to minimize conflicts with other compatible recreational uses and management programs. The Refuge will monitor hunter use, compliance with rules and regulations, and impacts to dove and other wildlife and use this information to adjust the hunt program as necessary to protect Refuge resources.

Hunting is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Dove hunting is a long-standing traditional use in southeast Texas, and has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby ultimately contributing to the overall mission of the National Wildlife Refuge System. Through management as a "Youth/Adult" hunt (all hunters 18 years of age and older must be accompanied by a youth hunter 17 years of age or younger), the dove hunt on Anahuac NWR will provide additional family-oriented recreational opportunity, with a focus on involving and educating youth.

Signature: Refuge Complex Manager: Andre T. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris SP 5-4-07
(Signature and Date)

Literature Cited

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COMPATIBILITY DETERMINATION: ANAHUAC NWR - FISHING

Use: Fishing

Refuge Name: Anahuac National Wildlife Refuge

County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR or Refuge) proposes to continue to provide fishing opportunities in designated areas that are compatible with Refuge purposes. Fishing is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. It is a wildlife-oriented recreational use and a traditional use of Anahuac NWR. This Compatibility Determination considers continuation of fishing on the Refuge, and includes consideration of modifications to the Refuge fishing program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Means of access for fishing opportunities on Anahuac NWR are supported by motorized vehicles, walking, and non-motorized boating. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with fishing.

Opportunities for fishing on Anahuac NWR are available year-round. Through the main refuge entrance, anglers have access to East Bay, the East Bay Boat Ramp and the Oyster Bayou Boat Ramp 24 hours a day, seven days a week. Overnight stays are permitted only for the purpose of nighttime fishing along East Galveston Bay, and are restricted to the vehicle pull-offs off of the Frozen Point Road and at the East Bay Boat Ramp parking area. There are no developed camp sites or other camping facilities at these locations (or elsewhere on the Refuge). Nighttime anglers typically sleep in vans or recreational vehicles, as the presence of biting insects generally do not support comfortable outdoor sleeping conditions. Other public use areas on the Refuge are open from one hour before sunrise to one hour after sunset, including the East Bay Bayou Tract. During fiscal year 2002, over 32,000 anglers utilized the Refuge for fishing or crabbing.

Fishing: Both saltwater and freshwater fishing opportunities are available on Anahuac NWR. Saltwater fishing opportunities are focused along the shoreline of East Bay, where many anglers wade fish for prized species including red drum, speckled trout, and flounder. Designated pull-offs along Frozen Point Road provide easy access to the bay. Additionally, anglers may fish along West Line Road, and roadside ditches provide opportunities to catch bait for personal use. Crabbing is a popular activity, especially along West Line Road.

Fishing access is also provided at the end of Frozen Point Road, following the primitive road leading to Oyster Bayou, as well as near Coon Creek (along the south end of Yellow Rail Prairie) and along West Line Road. These areas are designated by signs and open to foot travel only.

Freshwater fishing opportunities are available along East Bay Bayou on the East Bay Bayou Tract. 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 crappie, largemouth bass, gar, bowfin, and channel and blue catfish. Freshwater anglers may also fish along the banks of Shoveler Pond and along the canal from the Oyster Bayou Boat Ramp to the southwest corner of Shoveler Pond for species like gar and catfish.

Additionally, the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP (USFWS 2007) proposes to construct an accessible walkway from Frozen Point to East Bay to improve fishing access, and to increase interpretive materials regarding fishery resources.

Boating: Boating is not permitted on inland waters of the Refuge with the exception of the Oyster Bayou Boat Canal, and in designated areas during hunting season. Two boat ramps located on the Refuge provide access to Oyster Bayou and East Bay. Boat ramps facilitate launching of small, shallow-draft boats only. Small, non-motorized boats may be launched on East Bay Bayou at a primitive canoe launch located on the East Bay Bayou Tract. Airboats and personal watercraft are prohibited from launching on the Refuge.

Refuge boat ramps provide access to several area bayous and Galveston Bay, all of which are popular fishing destinations. These ramps are the primary public access points to portions of Oyster Bayou, Onion Bayou, Robinson Bayou and East Bay. Although fishing in these waters takes place off the Refuge, anglers and boaters utilize Refuge facilities, boat ramps and roads to access these areas.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage wildlife-dependent recreational fishing activities at existing and projected levels. Costs associated with this activity are primarily staff time. Refuge law enforcement officers regularly check anglers and crabbers for compliance with State and Refuge regulations. Additional costs involve maintenance to roads, boat ramps, and trails

providing access for fishing. Additional funds would be needed for the proposed construction of an accessible walkway from Frozen Point to East Bay to improve fishing access, and to increase interpretive materials regarding fishery resources. The Refuge would pursue a variety of funding sources in order to fully support this use, including agreements with other agencies, and grant funding and volunteer assistance.

Anticipated Impacts of the Use:

The potential impacts of the Anahuac NWR fishing program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered (T&E) species known to use the Refuge include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (*Alligator mississippiensis*, Threatened). It is expected that impacts to these species will be negligible. Bald Eagles are not observed in high numbers on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in Refuge sanctuary areas. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. Fishing activities may pose a potential conflict with American alligators, which are attracted to bait used by anglers. Alligators can become accustomed to the presence of anglers and the associated food source, thereby reducing their natural fear of humans and potentially creating a safety hazard. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of fishing on the Refuge.

Fishery Resources: The most direct effect of fishing on the Refuge is the mortality of harvested freshwater and saltwater fish, blue crabs, and several fish and shellfish species caught for use as bait. Fishing and crabbing on the Refuge occur under regulations promulgated by Texas Parks and Wildlife Department. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term. Continuation of fishing and crabbing on the Refuge should not have any measurable effect on overall populations and the long-term viability of these species' populations.

Similarly, the potential exists for over-harvest or illegal harvest of fisheries. Regular law enforcement patrols to ensure compliance with State and Federal regulations will assist in minimizing these potential impacts.

Migratory Birds and other Biological Resources: Some disturbance to wildlife from fishing activities is also expected. Fishing activities may influence the composition of bird communities (Tydeman 1977), as well as distribution, abundance, and productivity of waterbirds (Bell and Austin 1985). Jahn and Hunt (1964 as cited by Dahlgren and Korschgen 1992) reported that increases in recreational activity by anglers, boaters, and shoreline activity appeared to discourage breeding ducks and coots from using otherwise suitable habitat. Bell and Austin (1985) suggested that anglers fishing from the shoreline and boats displaced waterfowl from their preferred feeding and roosting areas and caused wigeon, green-winged teal, pochard and mallard to depart from a 174 ha reservoir prematurely. Cooke (1987) also documented that anglers on the bank and in boats often fished the shallow, sheltered bays and creeks that birds favor and negatively impacted distribution and abundance of waterfowl, grebes, and Eurasian coots. Cooke (1977 as cited by Liddle and Scorgie 1980) suggested that anglers create an area around them within which birds will not venture. Thus, an angler sitting on the shore can effectively exclude birds from his immediate vicinity.

Some disturbance of roosting and feeding shorebirds probably occurs (Burger 1981) but is considered minimal. During north winds, resulting low tides create extensive foraging habitat for shorebirds. Concurrently, however, fishing opportunities are thereby reduced or eliminated as waters become too shallow to fish. In these instances, temporal separation occurs between shorebird use and angler use.

Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Discarded fishing line and other fishing litter can entangle migratory birds and other wildlife and cause injury or death (Thompson 1969, Gregory 1991).

Additional biological impacts of fishing may include trampling of vegetation. In heavy use areas, this may cause plant mortality and subsequent erosion along shoreline areas (Liddle and Scorgie 1980, Hendee *et al.*, 1990). Smooth cordgrass (*Spartina alterniflora*) plantings are used to slow erosion along the East Bay shoreline. Anglers accessing the shoreline may cause cordgrass mortality through direct foot traffic. Additional law enforcement issues arise from anglers driving vehicles across the salty prairie ridge to access the East Bay shoreline, resulting in plant mortality and erosion. Further education and continued law enforcement will be needed to address this issue. The USFWS, under Refuge Management Alternative D of the Texas Chenier Plain EIS/CCP/LPP (USFWS 2007), proposes to construct an accessible walkway from Frozen Point Road to East Bay. This walkway will improve access to the bay while reducing vegetation impacts currently caused by anglers in this area.

Overnight stays for nighttime fishing along the East Bay shoreline are permitted, but are limited to vehicle pull-offs off of the Frozen Point Road and the East Bay Boat Ramp parking area. There are no developed camp sites or other camping facilities at these locations (or elsewhere on the Refuge). Nighttime anglers will typically sleep in vans or recreational vehicles, as biting insects typically do not support comfortable outdoor sleeping conditions. Because overnight stays are limited to these gravel roadsides, no impacts to vegetation or wildlife are expected from this activity.

Other Wildlife-dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. While areas on the Refuge open to fishing are also open to the other wildlife-dependent recreational uses, few conflicts between fishermen and other users of the Refuge have been documented. At current use levels, fishing occurring concurrently with wildlife observation and photography, environmental education and interpretation on some areas of the Refuge does not appear to detrimentally impact these other uses. However, litter generated from fishing activities could negatively impact the visual experience of refuge visitors (Marion and Lime 1986). Areas on the refuge open to fishing are not open to hunting, which minimizes potential conflicts and reduces safety issues.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible.
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

This section identifies the restrictions and regulations necessary to ensure compatibility of fishing on Anahuac NWR.

Fishing and crabbing are allowed in designated areas of the Refuge in accordance with State regulations and subject to Refuge-specific conditions. Fishing and crabbing are permitted along shoreline areas on East Bay, along East Bay Bayou on the East Bay Bayou Tract, along West Line Road, along the canal from the Oyster Bayou Boat Ramp to the southwest corner of Shoveler Pond, and along the banks of Shoveler Pond. Fishing is allowed using pole and line, rod and reel, or hand-held line only. Cast-netting for bait for personal use is permitted along waterways in areas open to the public and along public roads. Trotlines, setlines, jug lines, limb lines, bows and arrows, gigs, spears, and crab traps are prohibited. Spotlighting on the Refuge is illegal except for bay fishing on the shoreline along East Bay. Fishing from water control structures, and the harvesting of frogs and turtles, is prohibited. Harvesting fish and crabs for commercial purposes is prohibited.

Boating is not permitted on inland waters of the Refuge with the exception of the boat canal, and in designated areas during hunting season. Motorized boats may be launched at two boat ramps located on the Refuge providing access to Oyster Bayou and East Bay. Boat ramps facilitate launching of small, shallow-draft boats only. Small, non-motorized boats may be launched on East Bay Bayou at a primitive canoe launch located on the East Bay Bayou Tract, and along the shoreline on East Bay. Airboats and personal watercraft are prohibited from launching on the Refuge.

Overnight stays are permitted only for the purpose of nighttime fishing along East Galveston Bay, and are restricted to vehicle pull-offs on the Frozen Point Road and at the East Bay Boat Ramp parking area.

Continued law enforcement patrols and efforts to educate the public will be necessary to ensure compliance with the above stipulations and State and Federal fishing regulations.

Justification:

Continuation of fishing and crabbing on the Refuge should not have any measurable effects on overall populations of aquatic species and the long-term viability of these species' populations. The Texas Parks and Wildlife Department regularly adopts regulations in response to fish population levels and management needs. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term.

Fishing activities on Anahuac NWR typically occur along the shoreline of East Bay, and along East Bay Bayou. Other areas where fishing occurs on Anahuac NWR include waterways (ditches and canals) along roads and levees, in areas considered to be non-critical habitat for other wildlife. Additional areas of the Refuge remain closed to the public to provide sanctuary areas for wildlife. If fishing activity on Anahuac NWR increases substantially, additional stipulations may be needed to protect habitats and resources. Refuge staff will continue to monitor and evaluate use and associated impacts regularly.

Fishing is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Fishing has been a traditional form of outdoor recreation on the Refuge and in southeast Texas. When conducted in accordance with the stipulations listed herein, fishing would be compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature:	Refuge Complex Manager:	<u><i>Andee T. Lozano</i></u> 1-18-07 (Signature and Date)
Concurrence:	Regional Refuge Chief:	<u><i>Chris Sp...</i></u> 5-4-07 (Signature and Date)

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COMPATIBILITY DETERMINATION: ANAHUAC NWR – WILDLIFE OBSERVATION, PHOTOGRAPHY, ENVIRONMENTAL EDUCATION AND INTERPRETATION

Use: Wildlife Observation, Photography, Environmental Education and Interpretation

Refuge Name: Anahuac National Wildlife Refuge

County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR or Refuge) proposes to continue to provide wildlife observation, photography, environmental education and interpretation opportunities in designated areas of the Refuge that are compatible with Refuge purposes. These activities are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The continuation and enhancement of these programs will be addressed in this compatibility determination.

Wildlife Observation and Photography:

Wildlife watching is the most popular activity on Anahuac NWR, with over 42,000 visitors (59% of all visitors) in fiscal year 2002 indicating that wildlife observation was their primary reason for visiting the Refuge. Anahuac NWR offers fourteen miles of graveled roads, a 750 foot accessible boardwalk and photo blind, four miles of trails, and several observation platforms to view and photograph wildlife. Visitors are required to stay on designated roads and trails. Refuge public use areas are open from one hour before sunrise to one hour after sunset daily.

Auto Tour: Most visitors to Anahuac NWR can tour the Refuge and view wildlife from their vehicles. Fourteen miles of roads are open year-round, unless weather conditions make roads impassable. All Refuge roads open to vehicle traffic are available for wildlife observation and photography.

Wildlife Observation Trails: Five designated trails give visitors access to each of the native habitat types found on the Refuge – coastal marsh, coastal prairie, and woodlands, and to intensively managed habitats including moist soil units and rice fields. The Butterfly and Hummingbird Habitat Landscape and Willows Trail are two universally-accessible trails providing viewing opportunities for butterflies, hummingbirds, native flowering plants and prairie grasses, freshwater wetlands and a small coastal woodlot. Benches and observation platforms are located throughout the trails. The Levee Trail leads to an observation deck overlooking moist soil units, and the East Bay Bayou Trail follows the riparian corridor along East Bay Bayou and outlets to rice fields and moist soil units. Yellow Rail Trail, although not a trail, per se, is a designated area of salty prairie meadow that is open for exploration. Naturalist-led walks in the spring offer visitors the best chance to spot the secretive yellow rail that winters here. In addition, the Shoveler Pond Boardwalk is a universally-accessible boardwalk that extends 750 feet into Shoveler Pond, a 220-acre freshwater wetland.

Canoe Trail: A primitive launching pier gives canoeists and kayakers access to a 3.8 mile segment of East Bay Bayou. This stretch of water offers wildlife watching opportunities from a non-motorized boat. Boating is not permitted in inland waters of the Refuge except for the boat canal leading to Oyster Bayou.

Observation Platforms: Five observation platforms are located throughout the Refuge for viewing wildlife. In addition to the observation platform located at the end of the Shoveler Pond boardwalk, a wildlife-friendly overlook made of recycled plastic is also located on Shoveler Pond. Another platform is located on the Levee Trail, overlooking adjacent moist soil units. A covered platform on the East Bay Bayou Tract overlooks rice fields and moist soil units in rotation and an elevated overlook located on East Bay near the East Bay Boat Ramp offers views of the bay and adjacent marsh. These elevated platforms rise several feet above ground level providing refuge visitors an opportunity to see large expanses of habitat and associated wildlife.

Photography Blind: A universally-accessible photography blind is located on the Shoveler Pond Boardwalk, providing opportunities to view and photograph wildlife up close with minimal disturbance.

Other Non-priority Uses in Support of Wildlife Observation and Photography:

Bicycling and horseback riding occur in very limited numbers on the Refuge. Bicycling in support of wildlife observation is permitted on roads open to motorized vehicles only. Because Refuge roads are gravel, conditions for biking are poor, and use is therefore limited. Horseback riding in support of wildlife observation occurs very infrequently on the Refuge. Individuals interested in utilizing horses to view wildlife must stay on designated roads. Horseback riding as an organized trail ride is prohibited.

Environmental Education and Interpretation:

Visitor Information Station: In 2001, the Visitor Information Station (VIS) was constructed at the main entrance of the Refuge. The VIS includes interpretive exhibits and materials focusing on Refuge habitats and wildlife. Volunteers staff the VIS daily throughout the spring and on weekends the remainder of the year, providing information to and answering questions from visitors. In addition, the Friends of Anahuac Refuge manages a small nature store located in the VIS, selling educational materials related to the

natural resources of the Refuge and the surrounding upper Texas coast. All proceeds from the sale of merchandise go towards educational, interpretive, or habitat management needs of the Refuge. The VIS is staffed by Refuge volunteers. As the volunteer program continues to expand, the refuge aims to increase the number of days the VIS is open to the public.

Outdoor Education Program: An Outdoor Education Program on Anahuac NWR developed by the Friends of Anahuac Refuge enables students to learn about the natural world through hands-on educational activities. Designed for students in kindergarten through 5th grade, these programs are free to interested schools, are taught by volunteers, and take place outdoors on the Refuge. During the 2001-2002 school year, over 1,300 students participated in the Outdoor Education Program.

Interpretation: Eight outdoor interpretive signs throughout the Refuge currently describe various aspects of Refuge wildlife and habitats. The Visitor Information Station (VIS) houses a small interpretive exhibit and offers Refuge brochures and bird checklists to visitors. Interpretive tours and programs are provided by Refuge staff and volunteers to interested schools and organizations upon request. During FY02, over 900 individuals participated in interpretive tours of the Refuge.

Special events are held on the Refuge throughout the year to promote an awareness and understanding of the important natural resources found along the upper Texas coast. Family Fishing Day, Youth Waterfowl Expo, and Yellow Rail Walks are held annually.

Additional strategies to support wildlife observation, photography, environmental education and interpretation are identified under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007). These strategies include the addition of information kiosks, interpretive signs, exhibits, an observation platform, brochures, interpretive walks and the installation of a "web-cam". The development of educational programs for middle and high school students, audio-visual programs, Refuge videos, and a self-guided interpretive radio program are also included in these strategies, as well as the construction of a Refuge Complex headquarters and wildlife interpretive center. In addition, an entry fee program is proposed for Refuge visitors.

Availability of Resources:

Direct annual costs to administer these programs and facilities are primarily in the form of staff time. The development of new facilities and programs, as well as the maintenance and upkeep of existing facilities and programs, will be the primary costs associated with wildlife observation, photography, environmental education and interpretation offered on the refuge. Law enforcement support will continue to be necessary to ensure compliance with Refuge regulations. Additional funding will be required before the facilities and programs listed as strategies under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain EIS/CCP/LPP can be fully implemented. Refuge staff will pursue funding options through partnerships with other non-governmental organizations including the Friends of Anahuac Refuge, and pursue grants and matching funds to ensure that these strategies are implemented. The volunteer program on Anahuac NWR plays a significant role in the Refuge's ability to offer the existing programs and facilities on the Refuge, and volunteer support will continue to be critical in the Refuge's ability to fully implement the proposed strategies. The implementation of an entry fee on Anahuac NWR will also assist in covering costs associated with these strategies.

Anticipated Impacts of Use(s):

The potential impacts of the Anahuac NWR wildlife observation, photography, environmental education and interpretation programs on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered (T&E) species known to use the Refuge include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (*Alligator mississippiensis*, Threatened). It

is expected that impacts to these species will be negligible. Bald Eagles are not observed in high numbers on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in refuge sanctuary areas. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay. The most likely impact to Brown Pelicans may occur if visitors disturb birds resting or feeding along the East Bay shoreline. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels and are a primary attraction for wildlife observation. Some disturbance to basking alligators may occur from visitor use. Overall, no significant impacts to Federally-listed T&E species are expected to occur due to wildlife observation, photography, environmental education or interpretation on the Refuge.

Migratory Birds and other Biological Resources: Primary means of access to areas on the Refuge used for wildlife observation and photography include motorized vehicles on Refuge roads open to the public, walking on trails, boardwalks and observation platforms, and non-motorized boating in East Bay Bayou. A very small number of visitors use bicycles on public roads. An even smaller number ride horses on roads. Motorized vehicles and walking are used to access areas used for environmental education and interpretation on Anahuac NWR. Impacts associated with wildlife observation, photography, environmental education and interpretation activities vary based on mode of access. Walking, vehicles on roads, non-motorized boating, bicycling, and horseback riding all have the potential to disturb wildlife and influence distribution and habitat use.

Disturbance of wildlife by visitors is likely to be greatest in concentrated areas of use, including along trails, boardwalks, observation platforms and along roads (Klein 1993). While some species appear to acclimate to vehicular traffic, and even presence of visitors on trails, boardwalks, and observation platforms, other species are less tolerant of disturbance. Overall it is likely that species composition and abundance is decreased in areas supporting these recreational uses. However, by concentrating disturbances to these designated areas which constitute a very small portion of the Refuge, large and extensive tracts of undisturbed habitat remain available for wildlife throughout the Refuge.

Disturbance impacts to birds from visitation are often magnified during the breeding season. Color of clothing worn can attract or repel different passerine species based on breeding plumages of those species (Gutzwiller and Marcum 1997). Primary song occurrence and consistency of certain passerines can be impacted by a single visitor (Gutzwiller *et al.* 1994). Human disturbance may also limit the number of breeding pairs and production of certain passerine species (Reijnen and Foppen 1994). Predation on songbird, raptor, colonial nesting species and waterfowl nests tends to increase near more frequently visited areas (Dwernychuk and Boag 1972, Buckley and Buckley 1978, Lenington 1979, Boyle and Samson 1985, Miller *et al.* 1998). Glinski (1976) suggests that attracting wildlife using taped vocalizations may increase energy expenditures of wildlife, disrupt territory establishment, and increase susceptibility to predation.

In general, activities that occur outside of vehicles (along walking trails, etc), tend to increase disturbance potential for most wildlife species (Burger 1981, Klein 1993, Gabrielsen and Smith 1995). In wetland habitats, disturbance from out of vehicle approaches can reduce the time spent foraging or even cause avoidance of areas disturbed (Klein 1993). Similarly, walking tends to displace birds and can cause localized declines in species richness and abundance (Riffell *et al.* 1996).

On Yellow Rail Prairie, visitors are allowed to access a 10-acre area in an attempt to flush and view yellow rails. This is accomplished by walking slowly through the area, and is most successful when groups of people slowly walk parallel to each other dragging a rope in between participants. This activity occurs primarily during the months of March and April, and includes several guided "Yellow Rail Walks" led by Refuge staff or trained volunteers. Disturbance of rails flushed during this activity undoubtedly occurs and possibly leads to reduced utilization of this area by rails. Suitable undisturbed habitats exist adjacent to this site, and it is unlikely that this disturbance results in long-term negative impacts to individual rails or rail populations.

Walking with pets can cause additional disturbances to wildlife. Pets are known to both chase and kill wildlife (George 1974, Lowry and McArthur 1978). The greatest increase in heart rates of bighorn sheep occurred when approached by humans with a dog (MacArthur *et al.* 1982). Prairie chickens showed a stronger fear response to domestic dogs than to native predators such as foxes (Hamerstrom *et al.* 1965).

Vehicular use along the auto tour can impact Refuge wildlife and habitats directly or indirectly. Vehicles can cause wildlife mortality through direct impact (Dowler and Swanson 1982, Adams and Geis 1983, Rosen and Lowe 1994, Ashley and Robinson 1996). Reptiles are most likely to be impacted by vehicles as they sun themselves on or cross Refuge roads; however birds, mammals and amphibians are also susceptible. Vehicles can also cause disturbance to wildlife. Noise, vibration and visual stimuli may cause animals to avoid the vicinity of roads, and noise may mask communications (Busnel 1978, Zande *et al.* 1980, Reijnen and Foppen 1994, Spellerberg 1998). Although vehicles themselves can cause wildlife disturbance, wildlife often habituate to the presence of slow moving vehicles which ultimately can act as viewing blinds for those within.

Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Disturbance impacts caused by wildlife photographers tend to be greater than other wildlife observation techniques (Klein 1993, Morton 1995, Dobb 1998). Photographers are much more likely to leave their vehicles and approach wildlife on foot (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers with low power lenses to get much closer to their subject than other activities would require (Morton 1995).

Litter improperly discarded by visitors can entangle wildlife or be ingested, potentially resulting in injury or death (Gregory 1991). Efforts to educate the public about such issues are incorporated into outreach efforts and educational programs.

Impacts related to horseback riding may include exotic plant seed dispersal (Hammit and Cole 1987), soil compaction and erosion (Bainbridge 1974, Hammit and Cole 1987, Hendee *et al.* 1990) aesthetic concerns relative to horse manure (Lee 1975), direct wildlife disturbance (Owen 1973, Carlson and McLean 1996), and potential conflicts with other recreational users. As horseback riding is limited to refuge gravel roads, and use is very low, these impacts are negligible.

The above impacts are minimized on the Refuge by locating public use facilities away from sensitive areas, restricting public access to existing roads and trails, and through the strategic placement of trails, observation decks, boardwalks, and photography blinds. While some disturbance impacts occur along these linear corridors, extensive tracts of undisturbed habitats remain available for wildlife in areas adjacent to public use facilities and throughout the Refuge. Additionally, impacts are minimized through development and active enforcement of refuge-specific rules and regulations, including emergency closures if warranted, and through educational materials made available to the visiting public. As a result of active management of these wildlife-dependent recreational uses, direct, indirect and cumulative impacts to migratory birds and other biological resources from these uses remain at acceptable levels and will not affect the viability of any fish, wildlife or plant population on the Refuge.

Other Wildlife-dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. While all uses except hunting do occur concurrently on the portions of the refuge open

to the public, few conflicts between users have been documented. Areas on the refuge open to hunting are not open for these other uses, thereby eliminating potential conflicts and safety issues.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Stipulations designed to ensure compatibility for wildlife observation, photography, environmental education and interpretive programs outlined in the description of use section should minimize impacts to a point where these activities would be compatible with the purposes established for Anahuac NWR.

Designated refuge public use areas are open from one hour before sunrise to one hour after sunset daily. Access to the East Bay Boat Ramp, Oyster Bayou Boat Ramp, and East Bay shoreline for fishing is provided 24 hours a day along designated roads.

Although wildlife observation, photography, environmental education and interpretation occur via several different modes of access, all users must stay on designated roads and trails.

Yellow Rail Prairie, although lacking a clearly marked trail, is a designated 10-acre area that has been identified as the area of use. Due to the difficulty in walking on foot through this salty prairie meadow and adjacent marsh, limited use has occurred here outside of naturalist-led walks offered in the spring. Monitoring of use will continue to occur in this area, and if use begins to expand beyond the designated 10-acre area, clearly-defined use areas will be identified.

Boating is prohibited in inland waters of the Refuge (with the exception of some inland waters within designated hunt units during the waterfowl hunting season). All-terrain vehicles and off-road vehicle travel are prohibited. Airboats and personal watercraft are prohibited from launching on the Refuge.

Bicycling and horseback riding in support of wildlife observation is permitted on gravel roads only. Horseback riding as an organized trail ride is prohibited.

Recordings to attract wildlife are prohibited. Collection of plants or animals, or feeding or disturbing wildlife, is prohibited. Pets must be leashed at all times.

Public use trends and associated impacts from human activity will continue to be monitored. If significant increases in use occur, and/or if impacts to resources are determined significant, the program will be reevaluated and modified as necessary to ensure compatibility.

Justification:

These programs are determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. Wildlife observation, photography, environmental education and interpretation are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to

provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Facilities and activities related to wildlife observation, photography, environmental education and interpretation occur in designated areas of the Refuge, leaving large areas of undisturbed habitat available for wildlife. The stipulations outlined above are specifically designed to and should minimize potential impacts of these activities. The Refuge will continue to monitor uses and adjust programs as necessary to protect Refuge resources. The educational benefits gained from these activities are expected to outweigh their associated impacts. Providing opportunities for wildlife observation, photography, environmental education and interpretation has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby further contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andie T. Lozange 1-18-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Spivey 5-1-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: ANAHUAC NWR – CONTROLLED LIVESTOCK GRAZING

Use: Controlled Livestock Grazing

Refuge Name: Anahuac National Wildlife Refuge

County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act of 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR) proposes to continue the controlled grazing program in designated areas of the Refuge. Grazing is a refuge economic use which provides an important tool for management of Refuge habitats. This Compatibility Determination considers continuation of the controlled grazing program on the Refuge, and includes consideration of modifications to the program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Cattle grazing is an inexpensive, dependable, and effective tool used to accomplish Refuge goals, specifically for management of migratory birds including wintering and resident waterfowl, shorebirds and

wading birds. Grazing is used to: 1) open up dense vegetation; 2) depress perennial plants; 3) encourage growth of annual grasses and sedges; and 4) reduce tall, rank grass types and encourage creeping grass species. This program is implemented to encourage a mosaic of heavily, moderately, and ungrazed areas to provide habitats in multiple successional stages on the Refuge.

The grazing program on Anahuac NWR is a cow-calf operation with some bulls introduced for breeding. The cow bloodline is a mixed breed of Zebu ancestry, with Brahma, Angus or Charolais bulls used for breeding. Using a graze-rest strategy, permittees typically graze coastal marshes during the cool season, generally October through April and non-saline uplands during the warm season. An average of 11,501 (range 8,884 – 14,451) animal unit months (AUMs) occurred annually on Anahuac NWR between FY 1998-2005. Grazing strategies include variations in stocking rates, timing (cool vs. warm season) and duration. Stocking rates and rotations are determined annually according to management objectives for the various grazing units and the quantity and condition of forage in those units, and are often influenced by the availability of freshwater.

Grazing does not take place uniformly across units, particularly in coastal marshes. Cattle tend to concentrate grazing pressure adjacent to upland areas with decreased grazing pressure with increasing distance from high ground. Acres grazed and grazing pressure varies from year to year. In FY 2005, a typical year, approximately 20,954 acres was open to grazing, though cattle only utilized an estimated 12,250 acres.

Prescribed burning is an integral part of using cattle to meet management objectives. Fire can be used to create favorable foraging conditions for cattle and focus grazing pressure. Excluding high priority uplands, such as salty prairie sites, from burning can reduce grazing pressure where it is less desirable while focusing it on adjacent wetlands.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the grazing program at existing and projected levels. Costs associated with this activity are primarily staff time. Some additional expenses are incurred through site preparation work required to protect grazing infrastructure from fire operations. The cost of new or replaced infrastructure is shared between the permittee and the USFWS.

Anticipated Impacts of Use:

Controlled grazing can be an effective and inexpensive tool in wetland and grassland management providing habitat components that benefit waterfowl and other wildlife species. The relation of cattle grazing to wildlife varies considerably, depending on stocking rate, seasonality, plant community, and wildlife concerned (Chabreck 1968). Research indicates that dual use of grasslands by wildlife and livestock is often compatible when livestock grazing is carefully managed and wildlife needs are considered (Holechek 1982).

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use Refuge habitats include bald eagle (*Haliaeetus leucocephalus*, threatened), brown pelican (*Pelecanus occidentalis*, endangered), and American alligator (*Alligator mississippiensis*, threatened). Bald Eagles are not observed in high numbers on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in Refuge sanctuary areas. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. No impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of the grazing program on the Refuge.

Habitats: Grazing (integrated with fire and water management) in wetland habitats on the Refuge promotes the germination, growth and reproduction of several “early successional” target plant

communities which are especially beneficial to migratory birds as food sources (Allen 1956, Gosselink *et al.* 1979). Target plant communities in intermediate and brackish marsh habitats on the Refuge include olney bulrush (*Scirpus americanus*), saltmarsh bulrush (*Scirpus robustus*), seashore paspalum (*Paspalum vaginatum*), seashore saltgrass (*Distichlis spicata*) and annual grasses including millets (*Echinochloa* spp.) and sprangletops (*Leptochloa* spp.), several sedges, and several annual forbs such as purple ammenia (*Ammania coccinea*). Moderate grazing following burns in marshes also prolongs the availability of new grass shoots, a valuable food for snow geese (Gosselink *et al.* 1979). Grazing also helps provide optimal physical structure of vegetation for waterfowl utilization in emergent marshes and other vegetated wetlands (flooded moist soil and rice fields) by creating openings in otherwise dense stands of vegetation and maintaining plant communities such as seashore paspalum which grow low to the ground. These conditions also provide excellent habitat for many invertebrate species, another important food source for waterfowl and other migratory birds. Proper grazing of salty prairie seems to produce favorable nesting structure for Mottled Ducks.

Savory and Butterfield (1998) make an important distinction between what they call brittle and non-brittle landscapes. Brittleness is a term used to describe ecosystem resilience to disturbance and forms a continuum from brittle to non-brittle. Non-brittle environments have relatively high, evenly distributed rainfall, rapid recycling of nutrients through decaying plant and animal material and active microorganisms. Brittle environments tend to dry out quickly, have low nutrient recycling and low microorganism activity. Coastal marshes of the upper Texas coast are very much toward the non-brittle end of the spectrum. These marshes experience high annual rainfall distributed throughout the year, a long growing season, very fast nutrient recycling, and vegetation recoveries quickly following disturbances. These conditions require protracted disturbance events, such as grazing, to maintain early successional conditions for any length of time.

Studies conducted on Sabine National Wildlife Refuge in Cameron Parish, Louisiana (Valentine 1961) determined that increased grazing can change tall climax marshhay cordgrass stands to more diverse community such as seashore paspalum, *Setaria*, and longtom (*Paspalum lividum*), that are more beneficial to certain types of wildlife. Depending on site conditions (elevation, soil, and hydrology) annual grasses and forbs (including millets, fall *Panicum* (*Panicum dichotomiflorum*), sprangletop, and *Setaria*) can be produced through proper grazing.

Pate (2001) found that grazed marshes remained in a sub-climax state, while habitat within grazing exclosures reverted to marshhay cordgrass. At the onset of the study *Spartina* spp. made up 20% of the plant community, while seashore paspalum comprised 80%. By the end of the study, communities within grazing exclosures changed to 65% *Spartina* spp. and 25% seashore paspalum. In contrast, the grazed area maintained high cover of seashore paspalum throughout the study. Seashore paspalum provides habitat for many species of waterfowl, wading birds and shorebirds, depending on hydrology, while marshhay cordgrass largely precludes these species.

The detrimental affects of grazing in coastal marsh environments includes the risk of overgrazing if units are not closely monitored, bank erosion, excessive trampling of vegetation, compaction of soils reducing percolation rates, and the deposition of nutrients in the form of manure in areas where livestock concentrate (USFWS 1994). Warm-season grazing of wetland areas can reduce seed production of annual grasses (Chabreck 1968).

Prairie ecosystems in North America are adapted to episodic short duration and high intensity grazing followed by periods of rest, as bison and other native herbivores concentrated on recently burned areas feeding on new growth and moved on to new recently burned areas as the vegetation matured. Fire and grazing regimes generated a mosaic of prairie habitats, ranging from recently burned and heavily grazed areas to areas with mature grassland plant communities with no recent history of fire or grazing. On a landscape level, this diverse habitat mosaic supported a wide variety of grassland-dependent wildlife species. Fuhlendorf and Engle (2001, 2004) found that the strategic application of fire can focus grazing pressure and that shifting burned patches spatially and temporally creates landscape level habitat heterogeneity that benefits grassland-dependent flora and fauna.

Overgrazing in prairie habitats, usually caused by prolonged moderate to heavy grazing during warm season, can reduce native prairie plant diversity. While prairie ecosystems are adapted to short duration high intensity grazing patterns, grazing over extended periods can reduce native grasses and some native forbs, particularly those that are more palatable and are preferentially selected by livestock. To lessen this impact, the Refuge grazing program will incorporate more short duration, high intensity grazing regimes on upland grazing units. Lastly, soil disturbance by excessive hoof action can provide conditions favorable for establishment of exotic and invasive plant species such as Chinese tallow, and cattle can spread seed of undesirable plant species by physically carrying them or ingesting them. Increased monitoring and expanded invasive species control efforts may be needed to counter these impacts.

Migratory Birds and Other Biological Resources: Proper grazing can promote habitat for snow geese, puddle ducks, Wilson's snipe and rails (Chabreck 1968). Chabreck notes that anything more than light grazing would be detrimental to muskrats. Yeargan (2001) determined that the number of shorebirds, herons and egrets was greater in grazed than ungrazed marshes on Galveston Island, Texas, while the number of gulls, terns, sparrows, rails and other species was not different. Mizell (1998) studied wintering yellow rails on Anahuac NWR and suggested that cattle grazing may increase availability of yellow rail habitat.

Management tools used to set back plant succession (grazing, fire, mechanical disturbance, and herbicides) benefit most wetland-dependent species. The extent to which these tools are applied can be detrimental to some species, while benefiting others. An example of this would be an intensive grazing regime that reduces emergent wetland vegetation, benefiting waterfowl, shorebirds and wading birds, but detrimental to species desiring ranker conditions, such as sedge wrens and seaside sparrows. In the practical application of a tool like grazing, the available herd is focused in certain areas to achieve the moderate grazing regime desired, leaving large areas lightly grazed or ungrazed to the benefit of the species desiring the cover of emergent vegetation. Neither intensive grazing nor the lack of grazing is desired over the whole Refuge. Rather, a mosaic of heavily, moderately, and ungrazed habitats is the target of the grazing management program on the Refuge.

Wildlife-Dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Conflicts can occur between these uses and the controlled livestock grazing program, but conflicts and potential safety issues are minimized through management which includes regular and recurring maintenance of infrastructure (fences, gates, and cattleguards). In addition, grazing is excluded from refuge units supporting trails, boardwalks, observation platforms and other infrastructure used for wildlife observation and photography, environmental education and interpretation. Grazing units and refuge hunt areas do overlap without negative impacts to either program.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The controlled grazing program provides the Refuge with a management tool to improve habitat quality for migratory birds. The grazing program must assist the Refuge in meeting management objectives.

The grazing program is governed through the issuance of Special Use Permits to permittees. Stipulations necessary to ensure compatibility with Refuge establishment purposes and the mission of the NWRs are included as the Special Conditions of the Special Use Permit. Permittees must adhere to all conditions set forth in Special Use Permit, including the following:

Permittees will graze cattle in only designated locations of the Refuge. Stocking rates and pasture rotations will be specified by the Refuge Manager.

The Refuge Manager must be notified in advance of any introduction or removal of cattle. Permittees must annually provide a written record of cattle numbers and movements on an off the Refuge. Fences, gates, and cattleguards must be maintained by the Permittee with materials provided by the Refuge.

Permittees must comply with all state and federal livestock health laws.

Refuge staff and grazing permittees must continually monitor habitat conditions and communicate throughout the adaptive management cycle. Factors such as stocking rate, duration, and seasonality must be adjusted as necessary to meet Refuge objectives under changing environmental conditions. To be successful, all participants must understand successional relationships of plant communities and effects of decisions under changing environmental conditions to keep the program aligned with Refuge goals and management objectives. Both short- and long-term monitoring of grazing impacts on Refuge habitats is needed to guide this adaptive management approach.

Justification:

Controlled cattle grazing is an inexpensive, dependable, and effective tool for managing habitats on Anahuac National Wildlife Refuge. Applications of other disturbance tools, such as fire, are strongly influenced by weather conditions and numerous regulatory restrictions and are less likely to be available when needed. Grazing is a management tool that, in most instances, can be more dependably implemented to assist in maintaining habitat diversity by creating sub-climax vegetative conditions. This habitat diversity is critical to maintaining natural biological diversity on the Refuge. In the Refuge's coastal marshes, properly applied controlled grazing creates high quality habitat for wintering and resident waterfowl, shorebirds, wading birds and other migratory birds. High, well-distributed rainfall, rapid decomposition and recycling of nutrients, and long growing seasons makes coastal marshes a less brittle ecosystem (Savory and Butterfield 1998). When properly managed, there are few detrimental effects of grazing coastal marshes, most being aesthetic in nature. When conducted in accordance with the stipulations listed herein, controlled cattle grazing is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Horan 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: ANAHUAC NWR – COOPERATIVE RICE FARMING PROGRAM

Use: Cooperative Rice Farming Program

Refuge Name: Anahuac National Wildlife Refuge

County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act of 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Anahuac National Wildlife Refuge (NWR or Refuge) proposes to continue the cooperative rice farming program in designated areas that are compatible with Refuge purposes. Farming on the Refuge is accomplished through cooperative agreements with local farmers. This is an economic use of Refuge lands and provides a critical tool for Refuge management. Rice farming provides shallow freshwater wetland habitat, primarily for wintering and migrating migratory birds. This Compatibility Determination considers continuation of cooperative rice farming program on Anahuac NWR as proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

The Refuge has agreements with three local farmers who farm rice on approximately 500 to 700 acres annually on a three-year rotation, leaving approximately 1,000 to 1,200 acres of the Refuge farm as “maintenance” acreage. The farmers are required to disc, spray, or mow noxious weeds on all maintenance acres each year according to the USDA farm program. Cooperators are allowed to take the first rice crop and are required to maintain levees and flood fields after harvest. Generally rice is harvested in September or October. Several farmers have produced organically grown rice on the Refuge during the past ten years. Today almost 80% of the rice produced on the Refuge is organically grown. Organically produced rice reduces the overall input of pesticides on the Refuge.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the cooperative rice farming program at existing and projected levels. Costs associated with this activity are primarily staff time.

Anticipated Impacts of Use:

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use Refuge habitats include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (*Alligator mississippiensis*, Threatened). Bald Eagles are not observed in high numbers on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in Refuge sanctuary areas. Rice fields that support large numbers of wintering waterfowl may provide foraging habitat for bald eagles. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The cooperative rice farming program should pose no threat to alligators on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of the cooperative rice farming program on the Refuge.

Migratory Birds and other Biological Resources: The cooperative rice farming program on Anahuac NWR provides shallow freshwater wetland habitat and serves several management outcomes for migratory bird management on the Refuge: creating forage for migrating and wintering waterfowl, habitat for migrating shorebirds, and fresh water habitat for breeding and brood rearing king rails, Mottled Ducks and fulvous and black-bellied whistling ducks. Fields are prepared and planted in the spring, providing hundreds of acres of bare ground and shallow water habitat for migrating shorebirds. During the summer, irrigated fields and associated canals and drains provides emergent wetland nesting habitat commonly used by purple gallinules, fulvous whistling-ducks, king rails, common moorhens and least bitterns (Pierluissi 2006). Rice fields and infrastructure often provide the majority of freshwater nesting habitat for some of these species on the Refuge during drought years when sources of fresh water are a limiting factor. Flooding after harvest makes existing waste grain available to waterfowl and often produces a second crop of rice, which is also left for wildlife. During migration and wintering periods, waterfowl and waterbirds extensively use post-harvest rice fields that were cultivated and at least partially flooded (Czech and Parsons 2002). During the winter, flooded rice fields can provide waterbird habitat similar to natural wetlands (Elphick 2000).

Rice production has declined during the last decade in counties surrounding the Refuge, reducing this type of agricultural wetland habitat for waterfowl, shorebirds and other wetland-dependent species. Abandoned rice fields and pasturelands are susceptible to invasion by Chinese tallow, eastern baccharis, and deep-rooted sedge, all of which decrease habitat quality and require extensive restoration efforts. In the absence of the cooperative rice farming program, the acres involved would invariably become infested with Chinese tallow without intensive restoration and invasive species management.

Use of pesticides in the cooperative rice farming program has potential impacts to fish and wildlife, and in particular to aquatic resources. Careful oversight and monitoring of pesticide use by the Refuge

minimizes the potential for long-term impacts. All applications are done in accordance with state and federal laws and regulations, and using only Service-approved pesticides. Pesticide use is monitored and reported. Integrated pest management strategies which also include mechanical soil manipulation and water management are used to control plant and insect pests, with an overall goal of reducing pesticide use on the Refuge. Additionally, approximately 80% of the acres farmed annually on the Refuge are now farmed organically, thereby substantially reducing overall pesticide use.

Wildlife-Dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Several managed rice fields and adjacent public use facilities on the Refuge help support these uses, particularly wildlife observation and photography and waterfowl hunting.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Permittees must adhere to all stipulations and special conditions set forth in the Cooperative Farming Agreement/Special Use Permit. These include the following:

- Cooperators are allowed to take the first rice crop, but leave the second or ratoon crop for wildlife.
- Cooperators must maintain levees and flood fields after harvest.
- Cooperators must disc, spray, or mow noxious weeds on all maintenance acres each year according to the USDA Farm Program.
- Cooperators must use only those pesticides approved by the USFWS. Written records of pesticide applications must be provided annually.
- Use of any variety of genetically-modified rice seed is prohibited.

Changes in timing of field preparation and harvest, more efficient harvest technology, and more precise field leveling may, over time, reduce the value of rice farming to wildlife. Changes in the cooperative rice farming program must be evaluated in terms of wildlife benefits and economic viability. It is essential that Refuge staff evaluate new methods and technologies as they develop, and work with permittees to ensure that the program continues to support Refuge management objectives. Regular reevaluation of the program will be necessary to ensure compatibility in the long term.

Justification:

Rice agriculture provides many benefits to a variety of wildlife on the upper Texas coast. The cooperative rice farming program on Anahuac National Wildlife Refuge provides critical freshwater wetland habitat for shorebirds, rails, raptors, ducks, geese, wading birds and other waterbirds. Many rice fields play important roles in public use programs on the Refuge, particularly wildlife observation and public waterfowl hunting. In the absence of the cooperative rice farming program, the acres involved would invariably become infested with Chinese tallow without intensive restoration and invasive species

management. When conducted in accordance with the stipulations listed herein, the cooperative rice farming program is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Horange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: ANAHUAC NWR – COMMERCIAL ALLIGATOR HARVEST

Use: Commercial Alligator Harvest

Refuge Name: Anahuac National Wildlife Refuge

County: Chambers County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act of 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

"... 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 Stat. 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4) "... 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 ..." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

The commercial harvest of American alligators (*Alligator mississippiensis*) is administered on the Anahuac National Wildlife Refuge (NWR or Refuge) as a compatible refuge economic use. Additionally, the alligator harvest program supports meeting migratory bird management objectives, specifically for Mottled Ducks (*Anas fulvigula*), and is considered important for protecting public safety and water management infrastructure. This Compatibility Determination considers continuation of commercial alligator harvest on the Refuge, and includes consideration of modifications to the Refuge commercial alligator harvest program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/ Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

An overall goal of the alligator harvest is to maintain a healthy alligator populations, at densities consistent with the primary establishment propose of the Refuge. Under this goal, the specific objectives include:

1. Maintain overall alligator population age structure which maintains natural alligator social structure. Social structure and related interactions may be an important mechanism affecting overall alligator population dynamics by affecting recruitment and survival, influencing factors such as fecundity (reproductive age, clutch sizes and egg viability), overall breeding densities, and rates of cannibalism by adults on juvenile and subadult alligators.
2. Maintain alligator population density and distribution consistent with meeting population objectives for Mottled Ducks, a resident waterfowl species for which wetlands on the Refuge provide key nesting, brood-rearing and molting habitats.
3. Maintain alligator population density and distribution consistent with providing the public with opportunities for compatible wildlife-dependent recreational opportunities, specifically wildlife observation, photography, environmental education and interpretation.
4. Minimize adverse risks to public safety by minimizing the potential for negative alligator-human conflicts. This involves both public education and when necessary, removal of alligators from locations where conflicts are occurring or are likely to occur.
5. Maintain alligator population density consistent with acceptable levels of damage to water management infrastructure including levees and water control structures.

The Refuge alligator harvest program is conducted under the regulatory frameworks established by the State of Texas Alligator Management Program, administered by the Texas Parks and Wildlife Department (TPWD). In addition to establishing licensing requirements and harvest regulations, the TPWD annually determines the number and allocates hide tags to the Refuge (and other participating landowners). This annual allocation is based on alligator densities per designated habitat type, as indexed by the annual aerial nesting surveys, supplemented by nighttime spotlight surveys when available.

Individuals participating in the Refuge alligator harvest program are chosen randomly from a qualified group of applicants, and are issued Refuge Special Use Permits (SUP). The SUP contains special provisions and conditions which detail refuge-specific regulations and requirements governing alligator harvest on the Refuge.

Permittees are assigned specific target areas to remove alligators. These areas include moist soil units, reservoirs and areas within marsh units which are especially important as Mottled Duck brooding and molting habitats and adjacent canals and ditches. Selected areas where alligators are in frequent contact with the public and where there is potential for alligators to damage levees and other Refuge infrastructure are also targeted.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the commercial alligator harvest at existing and projected levels. Costs associated with this activity are primarily staff time.

Anticipated Impacts of Use:

Threatened and Endangered Species: Federally-listed Threatened and Endangered (T&E species) known to use the Refuge hunt units include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), and American alligator (Threatened). No impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of commercial alligator harvest on the Refuge. Bald Eagles are not observed in high numbers on the Refuge. They typically feed on wounded or sick birds, and are usually associated with large concentrations of wintering waterfowl that occur in refuge sanctuary areas. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay.

American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The most direct effect of the commercial alligator harvest program on the Refuge is the mortality of harvested alligators. From 1998-2006, annual harvest on the Refuge has ranged from 81 to 310 alligators (Table E-2). This program is administered under regulations promulgated by Texas Parks and Wildlife Department, and these regulations are designed to ensure that viable alligator populations are sustained over the long-term. Continuation of the commercial alligator harvest program should not have any measurable effect on the long-term viability of alligator populations on the Refuge.

Table E-2. Number of alligators harvested on Anahuac NWR, 1998 to 2006.			
Year	Number alligators harvested		
	Male	Female	Total
1998	47	34	81
1999	58	33	91
2000	50	40	90
2001	94	83	177
2002	145	165	310
2003	88	87	175
2004	96	101	197
2005	42	45	87
2006	54	50	104

In the late 1990's, harvest trends and some nighttime survey data suggested that the number of mature adult alligators on the Refuge was decreasing in harvested areas. To counter this trend, the USFWS worked to increase the percentage of subadult alligators in the harvest through a variety of means in order to reduce harvest pressure on mature adult alligators. Primarily because the traditional and most commonly used harvest methodology, the baited hook and line set overnight, is non-selective, these efforts were only moderately successful. A second factor limiting success is economic in nature. Subadult alligators are lower in value per foot in Texas, and the higher prices being paid by Texas commercial buyers/processors for the larger adult alligators creates an incentive for permittees to harvest larger adult alligators and a disincentive to harvest the smaller subadult alligators.

In recent years, administration of the alligator harvest program on the Refuge has been further modified to increase the percentage of subadult alligators in the overall harvest, and concurrently decrease harvest of the larger adult alligators. This is being accomplished by implementing experimental alligator harvest programs in cooperation with the TPWD, utilizing the Management Hide Tags available through the Texas Alligator Management Program for harvest of subadult alligators. Subadult alligators are considered to be those alligators 6' and less in length. The short-term goal is to ensure that subadult alligators comprise a minimum of 50% of the overall harvest on the Refuge, with a long-term goal for the harvest program is for subadult alligators to comprise a minimum of 70% of the annual harvest. Allocations of Management Hide Tags and the traditional CITES Hide Tags to Refuge permittees are geared toward meeting this new harvest objective.

The experimental harvest is conducted by Refuge permittees during the regular alligator season, using only TPWD-approved selective harvest methodologies. These include: 1) baited wooden dowel and line; 2) line with grappling hook; 3) bow and arrow; 4) baited hook and line only when permittee is present and fishing for a specific subadult alligator.

Since implementing the experimental harvest in 2004, harvest of subadult alligators has increased substantially, and now represents approximately 56% of overall harvest on the Refuge. Alligators less than 7' in length now constitute 80% of the harvest. Alligators greater than 7' in length now comprise only

20% of the harvest. This harvest strategy is expected to help ensure that the Refuge alligator population maintains a natural age distribution and social structure.

Migratory Birds and other Biological Resources: Commercial harvest of alligators could result in some disturbance to wildlife adjacent to hunted areas, especially those areas associated with canals. Some trampling of vegetation may also occur near harvest sites. However, it is anticipated that this disturbance would be minimal.

Various studies report differing predation rates on various types of wildlife (Giles and Childs 1949, Valentine *et al.* 1972, Eley *et al.* 2004). The mixed results of these studies are likely a result of varying seasonality, habitat, and prey availability. McNease and Joanen (1977) reported that alligator diets are mainly determined by availability and vulnerability of the prey species. Eley *et al.*, (2004) reported a relatively high frequency (20.9%) of Mottled Ducks in alligator stomachs taken from animals present in preferred Mottled Duck habitat with broods and molting birds present. This study indicates that alligators may have a deleterious effect on Mottled Ducks in certain habitats during certain phases of their life cycle (primarily flightless molting birds and broods). Additionally, this study found that smaller alligators consumed Mottled Ducks while larger alligators did not. Based on these data it is expected that managing the commercial alligator harvest to focus on smaller alligators and harvest in areas with high Mottled Duck use will have a beneficial impact on survival and annual recruitment on the Refuge.

Wildlife-dependent Recreational Uses: A major goal of Anahuac NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Some potential for conflicts between the commercial alligator harvest program and wildlife observation and photography does exist, but is minimized through spatial separation of these uses. In addition, visitation to the refuge for these uses is very low in September, when the commercial alligator harvest program is conducted.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The commercial harvest of alligators provides the Refuge with a management tool to improve habitat quality for target organisms while ensuring the long term viability of alligator populations. The harvest program must remain consistent with ensuring the conservation of alligators and assist the Refuge in meeting Refuge management objectives. The commercial alligator harvest program is governed through the issuance of Special Use Permits to approved permittees. Stipulations necessary to ensure compatibility with Refuge establishment purposes and the mission of the NWRS are included as the Special Conditions of the Special Use Permit. These include the following stipulations aimed at ensuring protection of Refuge resources and public safety:

- Permittee and their assistants must follow all State and Federal laws regarding alligator harvest as well as all conditions stated in the Special Use Permit. Violation of any Federal, State, or

Refuge regulation, or of any special condition of the SUP will result in immediate revocation of the SUP.

- Permittees must be experienced and pre-qualified to participate in this program. Final approval of eligibility rests with the U.S. Fish and Wildlife Service.
- No hunting will be allowed within 100 yards of a known alligator nest.
- Each Permittee may only take as many alligators as they are assigned tags. Within the frameworks set by the Texas Parks and Wildlife Department, harvest quotas for each Permittee will be set by the Refuge Manager, including harvest targets for subadult alligators.
- Permittees must take alligators only from designated areas as assigned by the Refuge Manager.
- Permittees must check sets and/or attempt to harvest alligators using approved methods on a daily basis until all tags are used.
- Allowed modes of motorized access will be specified by the Refuge Manager on an area-by-area basis.
- Permittee may only take alligators by using methods approved by the Texas Parks and Wildlife Department. Wildlife is not permitted to be used as bait.
- All alligators on hook and line sets will be killed immediately. Each alligator must be tagged immediately after being killed. Transport of an untagged alligator is prohibited.
- Firearms (minimum caliber of 22 magnum) may only be used to kill hooked alligators. If shotguns are used, only federally approved non-toxic shot will be permitted. All weapons must be unloaded and encased while in Refuge parking areas, boat launches, or in route to and from designated harvest areas.
- No alligator sets will be allowed in areas that jeopardize public safety.

Compliance with these and all other Special Conditions of the Special Use Permit is necessary to ensure the compatibility of the commercial alligator harvest program.

Justification:

The commercial harvest of alligators is managed on the Anahuac NWR so as to ensure the long-term conservation of healthy alligator populations, while providing the Refuge with a management tool to help meet migratory bird management objectives, protect important management infrastructure, and protect public safety. This program is administered under regulations promulgated by Texas Parks and Wildlife Department, and these regulations are designed to ensure that viable alligator populations are sustained over the long-term. In addition, the USFWS regulates the alligator harvest program on the Refuge through issuance of a Special Use Permit which contains stipulations also designed to conserve alligator populations and best meet management objectives. For example, special regulations are in place to restrict harvest of reproductive-aged alligators and maintain a natural age structure within the Refuge alligator population. Continuation of the commercial alligator harvest program should not have any measurable effect on the long-term viability of alligator populations on the Refuge. When conducted in accordance with the stipulations listed herein, the commercial alligator harvest program is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andue J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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Valentine, J.M., Jr., J.R. Walther, K.M. McCartney, and L.M. Ivy. 1972. Alligator diets on the Sabine National Wildlife Refuge, Louisiana. *Journal of Wildlife Management* 36(3):809-815.

COMPATIBILITY DETERMINATION: MCFADDIN NWR – WATERFOWL HUNTING

Use: Waterfowl Hunting
Refuge Name: McFaddin National Wildlife Refuge
Counties: Jefferson, Galveston, and Chambers counties, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

McFaddin National Wildlife Refuge (NWR or Refuge) proposes to continue to provide waterfowl hunting opportunities (for ducks, geese, and coots) in designated areas that are compatible with Refuge purposes. Hunting is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Waterfowl hunting is a long-standing traditional use on and around McFaddin NWR. This Compatibility Determination considers continuation of waterfowl hunting on the Refuge and includes consideration of modifications to the Refuge hunting program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP).

Waterfowl hunting on McFaddin NWR is supported by several modes of access, including motorized vehicles, outboard motor boats, airboats, non-motorized boats, bicycles, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with waterfowl hunting.

Opportunities for waterfowl hunting on McFaddin NWR will be available within the season set by Texas Parks and Wildlife Department in compliance with annually published regulations. Designated hunting areas will be open during established State waterfowl seasons, with the exception that hunting for ducks and coots will not be allowed on the Refuge until the last Saturday in October (not including the September teal and youth-only seasons). If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date.

In addition, if the light goose conservation order is in effect, these season dates may be reduced on the Refuge in accordance with the timing of the departure of geese from the area, typically late February. All applicable State and Federal regulations are enforced.

The waterfowl hunting season generally falls within the period September- February. Traditionally, the hunting season on the Texas coast begins in September with the early teal season. The regular waterfowl season follows, often beginning in late October and running through January. The light goose conservation order typically begins at the end of the regular waterfowl season in January and runs through March.

Four different hunt units are open to waterfowl hunting on McFaddin NWR (Figure E.2.), including the Spaced Hunt Unit (5,050 acres), the Star Lake/Clam Lake Hunt Unit (10,800 acres), the Central Hunt Unit (4,850 acres), and the Mud Bayou Hunt Unit (2,210 acres). These four hunt units total approximately 22,900 acres. These units occur primarily in coastal marsh habitats, including saline, brackish and intermediate marshes.

The four hunt units are open on different days of the week to provide hunting opportunities throughout the week, as well as periods of rest for waterfowl. The Central Hunt Unit, the Star Lake/Clam Lake Hunt Unit and the Mud Bayou Hunt Unit will be open daily during the early teal season. The Spaced Hunt Unit, the Central Hunt Unit, and the Star Lake/Clam Lake Hunt Unit will be open for waterfowl hunting on Saturdays, Sundays and Tuesdays of the regular waterfowl season. The Mud Bayou Hunt Unit will be open on Sundays, Wednesdays, and Fridays during the regular waterfowl season. All hunt units are closed on Thanksgiving, Christmas and New Year's Day.

Hunters may enter Refuge hunt units between 4:00 am and ½ hour before shooting time. All hunts are morning-only hunts. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm.

A waterfowl hunting permit must be signed and in the possession of the hunter while hunting on any of the Refuge hunt units. This permit is available at no charge and serves to inform the hunter of Refuge-specific regulations. In addition, a reservation is required for hunting the Spaced Hunt Unit during the regular waterfowl season. A daily user fee is currently required for those hunting the Spaced Hunt Unit. In FY02, approximately 5,000 hunters utilized the Refuge for waterfowl hunting.

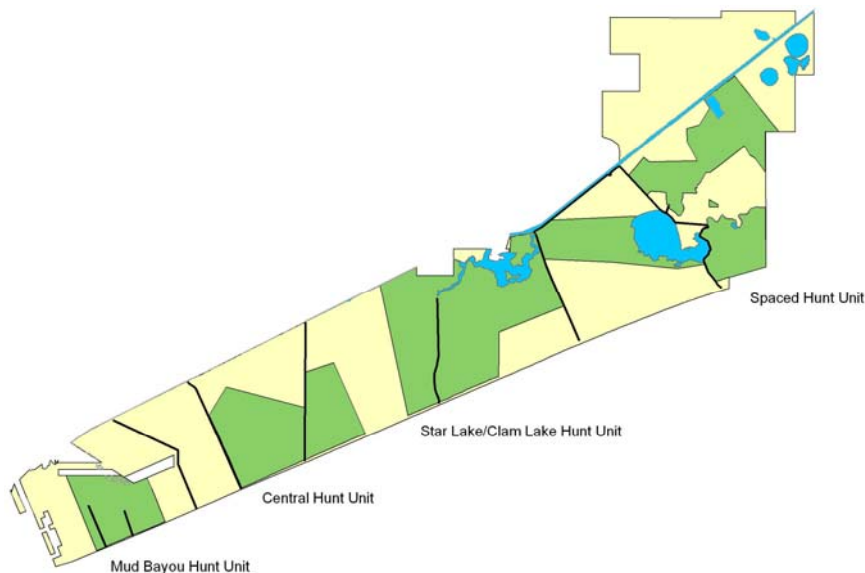


Figure E.2. Location of waterfowl hunt units on McFaddin NWR.

Waterfowl hunting is a long and established tradition in the coastal marshes of southeast Texas, and occurred on Refuge lands long before the establishment of the Refuge. Additional public waterfowl hunting opportunities exist in the area at the State managed J.D. Murphree Wildlife Management Area, the Wallisville Lake Project managed by the U.S. Army Corps of Engineers, and the Texas Point, Anahuac and Sabine National Wildlife Refuges managed by the USFWS. 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.

Availability of Resources:

Costs to administer the hunt program will mostly be salaries and facilities maintenance. This would include staffing the waterfowl check station throughout the season to issue permits, collect fees, provide information and collect harvest data. A staffed check station improves visitor services and the quality of a visitor's experience by providing orientation and guidance. Additionally, valuable biological data on migratory birds are collected by Refuge staff at waterfowl check stations. Other costs to administer the program includes law enforcement throughout the season by Refuge law enforcement staff, as well as sign posting, development and publishing of Refuge-specific regulations and permits, and responding to public inquiries and requests for permits. Existing facilities requiring regular maintenance include the accessible hunt blind, the waterfowl check station, parking areas, portable restrooms, roads, and boat ramps. The length of the season as determined annually by the State may result in an increase or decrease in the number of staff days required to administer the program.

User fees for waterfowl hunting on McFaddin NWR assist with costs associated with running the hunt program, however as previous years have demonstrated, these funds have been insufficient to cover all costs associated with the program. Base funding will also be needed to manage the program. Volunteer workdays will continue to be organized in order to help prepare the hunt units for the upcoming seasons.

In addition to season length, hunter trends, either up or down, will result in an increase or decrease in staffing needed. If hunter use considerably declines on the Refuge, along with associated fees, the Refuge may need to consider alternatives for staffing the check station. Though not preferred, a self-registering procedure may be developed in response to such trends.

Anticipated Impacts of Use:

The potential impacts of the McFaddin NWR waterfowl hunt program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use the Refuge hunt units during waterfowl season include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). It is expected that impacts to these species will be negligible. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast, though are seldom reported on McFaddin NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The waterfowl hunt program should pose no threat to alligators on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of waterfowl hunting on the Refuge.

Habitats: The greatest potential for impacts to vegetation resources and habitats on the Refuge likely comes from motorized boating activities. Many Refuge hunt areas are accessible only or primarily by motorized boat. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species.

Foot traffic in areas open to hunting can lead to vegetation trampling, and in heavy use areas, cause plant mortality. Some vegetation trampling and trailing from hunter foot traffic occurs in marsh habitats in hunt areas, although these impacts tend to be short-term.

These impacts are expected to be localized and minimal. Regulations, including motorboat and horsepower restrictions are used to protect wetland habitats and public safety.

Migratory Birds and Other Biological Resources: The most direct effect of hunting on the Refuge is the mortality of harvested waterfowl species resulting from hunting activities. Regulations governing harvest in states in the Central and Mississippi Flyways are developed annually through the Federal framework process for harvest of migratory birds in the U.S. This process is designed to ensure that viable waterfowl populations are sustained over the long-term. Overall, harvest on the Refuge, and cumulatively on all national wildlife refuges open to migratory bird hunting, constitutes a very small percentage of the overall harvest of migratory birds in these Flyways. The continuation of the waterfowl hunting program on the Refuge under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP (USFWS 2007) will not have any measurable effect on overall populations of hunted waterfowl species and the long-term viability of these populations.

Harvest statistics for the Spaced Hunt and Star Lake/Clam Lake hunt units of the McFaddin NWR are collected annually through the operation of hunter check station. Annual harvest statistics for the years 2000-2007 are presented in Table E-3 below. These data do not represent total harvest on the Refuge, as harvest information is not collected from hunters utilizing the Mud Bayou and Central hunt units. Green-winged teal, gadwall, lesser scaup, blue-winged teal and Northern shoveler are the principal duck species harvested on the Refuge. Snow geese and Greater white-fronted geese comprise the majority of the refuge goose harvest.

Many studies have documented the effects of hunting intensity on the number of birds utilizing an area (Madsen *et al.* 1992 as cited by Fox and Madsen 1997). This study demonstrated that relatively light hunting pressure can reduce waterfowl abundance in hunted areas. Distribution and habitat use, feeding patterns, and the nutritional status of waterfowl have also been shown to be affected by hunting activities. Hunting activity can cause birds to alter habitat use, change feeding locations (Madsen 1995), feed more at night (Thornburg 1973, Morton *et al.* 1989) and reduce the amount of time spent feeding (Korschgen *et al.* 1985, Madsen 1995). Collectively, these changes in behavior have the potential to adversely impact the nutritional status of waterfowl (Bélanger and Bédard 1995).

Hunting may have a more significant impact on resident Mottled Ducks. Pair bonds for Mottled Ducks begin earlier than northern nesting birds and disturbance caused by hunting may disrupt the reproductive cycle for this species. Additionally, opening the regular waterfowl season before the arrival of migrating ducks from northern breeding areas allows for disproportionate harvest of resident birds, primarily Mottled Ducks. Refuge-specific regulations prohibit the opening of the general waterfowl season on the Refuge any earlier than the third Saturday in October in order to prevent this impact.

Monthly aerial surveys of wintering waterfowl on the Refuge have documented the disproportionate use of established sanctuary areas by waterfowl, as compared to the areas open to hunting. This further supports the above studies and indicates that hunting affects the overall distribution of wintering waterfowl on the Refuge. It has been shown that sanctuary areas on the wintering grounds are effective in maintaining local waterfowl populations in a landscape subject to hunting pressure (Bellrose 1954, Madsen 1998). Heitmeyer and Raveling (1988) found that waterfowl used sanctuaries during the day and local rice fields at night. Similarly, Fleskes *et al.* (2005) found northern pintail used areas closed to hunting during the day and dispersed throughout the area at night. These data indicate that while sanctuaries are effective in maintaining local waterfowl populations through the hunting season, birds must disperse at night to feed.

Sanctuary areas tend to support greater numbers of waterfowl the longer they have been established. Bellrose (1954) found that traditional sanctuary areas support higher populations of migrating ducks than newly established sanctuary areas. Similarly, Madsen (1998) found that it took two to six years between

Table E-3. Waterfowl harvest on the Spaced and Star Lake-Clam Lake hunt units, McFaddin NWR, 2000 – 2006. Data collected at the McFaddin NWR waterfowl hunter check station.*

Species	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007
Whistling-Duck species	0	3	1	0	0	2	7
Greater White-Fronted Goose	80	11	3	8	3	3	4
Light Goose	142	37	60	16	25	82	75
Canada/Cackling Goose	1	1	3	4	0	0	3
Wood Duck	34	42	32	11	6	5	13
Gadwall	734	860	276	442	206	968	452
American Wigeon	89	129	40	75	43	113	83
Mallard	191	130	118	51	46	100	48
Mottled Duck	142	92	94	121	101	133	153
Blue-winged Teal	261	212	334	328	291	297	390
Northern Shoveler	587	236	97	236	105	233	193
Northern Pintail	154	111	16	10	21	128	68
Green-winged Teal	1557	720	346	509	383	927	763
Canvasback	27	1	0	1	1	56	59
Redhead	16	11	4	11	6	34	18
Ring-necked Duck	40	75	57	35	28	37	124
Scaup species	713	277	591	169	338	1015	274
Bufflehead	5	4	2	2	0	6	1
Hooded Merganser	5	15	11	3	5	20	8
Ruddy Duck	13	6	2	0	1	17	4
Other	8	26	11	17	16	39	111
Total Birds	4799	2999	2098	2049	1625	4215	2851

*Harvest statistics collected during the regular waterfowl season only.

the creation of sanctuary areas and the time when peak numbers of dabbling ducks were reached. These data indicate that traditional, long-term sanctuary areas are more valuable to maintaining local waterfowl populations than sanctuary areas that shift from year to year.

Presumably, providing waterfowl with predictable undisturbed sanctuary areas increases the ability of birds to meet the obligations of their annual cycle. Waterfowl undergo considerable physiological demands during winter. Heitmeyer (1988) estimated that prebasic molt in female mallards required an additional three grams per day of protein over base metabolic rates. These demands approach the estimated five grams per day associated with reproduction. Pair formation for most North American waterfowl takes place away from the breeding grounds. Waterfowl must accumulate endogenous energy reserves to meet the demands of courtship (Afton and Saylor in Baldassarre and Bolen 1994). Baldassarre and Bolen (1994) proposed that birds that do not accumulate energy reserves may have less time and energy at their disposal to initiate courtship and/or may be unable to maintain previously established pair bonds. Clearly, birds must meet high energy demands to successfully fulfill critical wintering components of their annual cycle. Further, Heitmeyer and Fredrickson (1981) build a scenario where endogenous reserves established on wintering grounds return mallards to breeding areas in better condition to begin nesting, leading to larger clutch sized and earlier nests, which tend to be more successful. Providing sanctuary areas of adequate size adjacent to quality feeding areas may contribute to the ability of birds to meet the physiological demands required during winter and possibly the subsequent nesting cycle.

The size, location and habitat quality of sanctuary areas on the Refuge remains critically important to ensure that migrating and wintering populations of waterfowl maintain sound nutritional and physiological status. Overall, it is expected that the maintenance of traditional sanctuary areas on the Refuge adequately mitigates for impacts from hunting activities. In years of particularly poor habitat quality due to

climatic extremes or tidal flooding from tropical disturbances, however, it is possible that hunting activities would result in reduced abundance of wintering waterfowl on the Refuge.

Although the impacts of waterfowl hunting on wetland-dependent migratory and resident birds which are not hunted is likely less than for waterfowl, studies have demonstrated that hunting (including accessing hunt areas) does affect abundance and distribution of these other avian species. The noise associated with shooting likely reduces habitat utilization by shorebirds, wading birds, other marsh and waterbirds, and landbirds using wetland habitats within hunt areas, at least while hunting is occurring.

Incidental take of other wildlife species, either illegally or unintentionally, may occur with any consumptive use program. At current and anticipated public use levels and based on past history, incidental take is expected to be small and will not directly or cumulatively impact current or future populations of wildlife on the Refuge.

Means of access to and within Refuge hunt areas include motorized boating (primarily in Star Lake, Clam Lake, Mud Bayou and the Spaced Hunt Unit), non-motorized boating, motorized vehicles, and walking. Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

McFaddin NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife in areas outside of boating activity.

A variety of regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Other Wildlife-Dependent Recreational Uses: A major goal of McFaddin NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Few conflicts among users of the Refuge have been documented in relation to waterfowl hunting. Where the potential for conflicts is greatest, seasonal closures of Refuge hunt units to other recreational uses during the waterfowl season minimizes potential conflicts and safety issues among users of the Refuge.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To reduce the impact of hunting on the resident Mottled Duck, modifications may be placed on opening dates for the regular waterfowl season. Season dates on the Refuge will be concurrent with Texas Parks and Wildlife Department for the September teal season, youth-only season, and duck and coot regular season in the Texas South Zone, and goose regular season in the Texas East Zone, with the exception that hunting for duck (not including the September teal and youth-only seasons) and coot will not be allowed on the Refuge until the last Saturday in October. If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date.

All waterfowl hunters must follow the stipulations set forth in the waterfowl hunting regulations published annually by the Refuge.

The Central Hunt Unit, the Star Lake/Clam Lake Hunt Unit and the Mud Bayou Hunt Unit will be open daily during the early teal season. The Spaced Hunt Unit, the Central Hunt Unit, and the Star Lake/Clam Lake Hunt Unit will be open for waterfowl hunting on Saturdays, Sundays and Tuesdays of the regular waterfowl season. The Mud Bayou Hunt Unit will be open on Sundays, Wednesdays, and Fridays during the regular waterfowl season.

All hunts are morning-only hunts. Hunters may enter Refuge hunt units between 4:00 am and ½ hour before shooting time. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm.

All other refuge units are closed to waterfowl hunting. Long-term, traditional sanctuary areas will remain as sanctuary, with no public access permitted in those areas.

Access into hunt areas may be by foot, bicycle, non-motorized boat, outboard motorboat, or airboat. Bicycles are permitted on refuge roads open to motorized vehicles and designated levees only. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less, and engines may not exceed 2 cylinders and 484 cc.

On inland waters of Refuge hunt areas open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of Refuge hunt units will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on the 10-Mile Cut portion of Salt Bayou and on Mud Bayou. This grace period of 5 years is aimed to provide those hunters currently using boats with a horsepower greater than 25 ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

A limited number of parties will be permitted to enter the Star Lake/Clam Lake Hunt Unit and the Spaced Hunt Unit. No limits are currently in place for numbers of hunters or parties on the Central Hunt Unit and Mud Bayou Hunt Unit.

The use of retrieving dogs will continue to be allowed and encouraged in all areas open to waterfowl hunting for the conservation of downed birds. Dogs must be under the control of handlers at all times.

The Refuge will maintain an active law enforcement presence in an effort to maximize compliance with State and Federal waterfowl hunting regulations. Annual monitoring of hunter use and impacts will be implemented. The information gathered will be used to review and possibly revise hunting regulations to enhance the quality and safety of the Refuge's hunting program, and to ensure that waterfowl hunting activities will continue to be compatible with Refuge purposes and the mission of the National Wildlife Refuge System.

Justification:

The McFaddin NWR waterfowl hunting program is determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. The Refuge provides quality waterfowl habitats for thousands of migratory birds annually. Migratory bird populations and harvest parameters are monitored and managed on a flyway basis and are designed to ensure the long-term sustainability of populations. Additionally, the hunt program on the Refuge is specifically designed to provide quality public hunting opportunities while minimizing potential impacts to local populations of migratory birds and their habitats.

Refuge-specific regulations are in place to minimize potential adverse impacts from hunting-related disturbance to wildlife and habitats. Regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. Of critical importance is the USFWS' ability to manage and maintain traditional sanctuary areas. The Refuge waterfowl hunt program is also managed in such a way to minimize conflicts with other compatible recreational uses and management programs. The Refuge will continue to monitor hunter use, compliance with rules and regulations, and impacts to waterfowl and other wildlife and use this information to adjust the waterfowl hunt program as necessary to protect Refuge resources.

Hunting is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Waterfowl hunting is a long-standing traditional use on and around McFaddin NWR, and has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby ultimately contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: MCFADDIN NWR - FISHING

Use: Fishing

Refuge Name: McFaddin National Wildlife Refuge

County: Jefferson, Galveston and Chambers counties, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

McFaddin National Wildlife Refuge (NWR or Refuge) proposes to continue to provide fishing opportunities in designated areas that are compatible with Refuge purposes. Fishing is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. It is a wildlife-oriented recreational use and a traditional use of McFaddin NWR. This Compatibility Determination considers continuation of fishing on the Refuge, and includes consideration of modifications to the Refuge fishing program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Fishing on McFaddin NWR is supported by several modes of access, including motorized vehicles, outboard motor boats, airboats, non-motorized boats, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with fishing.

Opportunities for fishing on McFaddin NWR are available year-round in Clam Lake, 10-Mile Cut, Mud Bayou, Mud Lake and designated areas along the bank of the Gulf Intracoastal Waterway (GIWW) and roadside ditches. Seasonal fishing opportunities are available in Star Lake and 5-Mile Cut between March 15th and August 31st. The Refuge is currently open daily to the 10-Mile Cut bridge from 6:00 am to sunset. Access beyond the bridge is available Monday through Friday from 7:30 am to 4:00 pm. During fiscal year 2002, approximately 6,250 anglers utilized the Refuge for fishing or crabbing.

Saltwater fishing opportunities are found in 10-Mile Cut, Mud Bayou, Mud Lake, Star Lake, 5-Mile Cut, Clam Lake and in designated areas along the shoreline of the Gulf Intracoastal Waterway (GIWW) and roadside ditches. Five fishing piers located along the banks of Clam Lake and the bridge at 10-Mile Cut provide additional locations for fishing. Crabbing is a popular activity, especially along Clam Lake and 10-

Mile Cut. Blue crab, alligator gar, flounder, and red drum are just some of the species that anglers may catch while fishing on the Refuge.

The Refuge has five boat ramps that are available to anglers. Boat ramps are located on Star Lake, 5-Mile Cut, 10-Mile Cut and Clam Lake (2). Boat ramps facilitate launching of small, shallow-draft boats only. Personal watercraft are prohibited from launching on the Refuge.

The USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007) proposes to extend open hours beyond 10-Mile Cut to one hour before sunrise to one hour after sunset seven days a week to facilitate additional recreational fishing and other wildlife-dependent recreational opportunities. Additionally, the preferred alternative proposes to construct a new boat launch and parking facility on 10-Mile Cut; improve freshwater and youth fishing opportunities in Pond 13; construct a fishing platform to improve access for fishing near the Star Lake water control structure along the GIWW, and increase interpretive materials regarding fishery resources.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage wildlife-dependent recreational fishing activities at existing and projected levels. Costs associated with this activity are primarily staff time. Refuge law enforcement officers regularly check anglers and crabbers for compliance with State and Refuge regulations. Additional costs involve maintenance of roads, boat ramps, and fishing piers providing access for fishing. Additional funds would be needed to implement the proposed strategies listed under Refuge Management Alternative D of the EIS/CCP/LPP. The Refuge would pursue a variety of funding sources in order to fully support this use, including agreements with other agencies, and grant funding and volunteer assistance.

Anticipated Impacts of the Use:

The potential impacts of the McFaddin NWR fishing program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use the Refuge include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). It is expected that impacts to these species will be negligible. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast, though are seldom reported on McFaddin NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. Fishing activities may pose a potential conflict with American alligators, which are attracted to bait used by anglers. Alligators can become accustomed to the presence of anglers and the associated food source, thereby reducing their natural fear of humans and potentially creating a safety hazard. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of fishing on the Refuge.

Habitats: The greatest potential for impacts to vegetation resources and habitats likely comes from motorized boating activities. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with

concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species.

Foot traffic in areas open to fishing can lead to vegetation trampling. In heavy use areas, this may cause plant mortality and subsequent erosion along shoreline areas (Liddle and Scorgie 1980, Hendee *et al.* 1990).

Fishery Resources: The most direct effect of fishing on the Refuge is the mortality of harvested freshwater and saltwater fish, blue crabs, and several fish and shellfish species caught for use as bait. Fishing and crabbing on the Refuge occur under regulations promulgated by Texas Parks and Wildlife Department. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term. Continuation of fishing and crabbing on the Refuge should not have any measurable effect on overall populations and the long-term viability of these species' populations.

Similarly, the potential exists for over-harvest or illegal harvest of fisheries. Regular law enforcement patrols to ensure compliance with State and Federal regulations will assist in minimizing these potential impacts.

Migratory Birds and other Biological Resources: Some disturbance to wildlife from fishing activities is also expected. Fishing activities may influence the composition of bird communities (Tydeman 1977), as well as distribution, abundance, and productivity of waterbirds (Bell and Austin 1985). Jahn and Hunt (1964 as cited by Dahlgren and Korschgen 1992) reported that increases in recreational activity by anglers, boaters, and shoreline activity appeared to discourage breeding ducks and coots from using otherwise suitable habitat. Bell and Austin (1985) suggested that anglers fishing from the shoreline and boats displaced waterfowl from their preferred feeding and roosting areas and caused wigeon, green-winged teal, pochard and mallard to depart from a 174 ha reservoir prematurely. Cooke (1987) also documented that anglers on the bank and in boats often fished the shallow, sheltered bays and creeks that birds favor and negatively impacted distribution and abundance of waterfowl, grebes, and Eurasian coots. Cooke (1977 as cited by Liddle and Scorgie 1980) suggested that anglers create an area around them within which birds will not venture. Thus, an angler sitting on the shore can effectively exclude birds from his immediate vicinity. Some disturbance of roosting and feeding shorebirds probably occurs (Burger 1981) but is considered minimal.

Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Discarded fishing line and other fishing litter can entangle migratory birds and other wildlife and cause injury or death (Thompson 1969, Gregory 1991).

McFaddin NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife in areas outside of boating activity.

A variety of regulations govern means of access to public fishing areas, including boat motor and horsepower restrictions. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Other Wildlife-dependent Recreational Uses: A major goal of McFaddin NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. While areas on the Refuge open to fishing are also open to the other wildlife-dependent recreational uses, few conflicts between fishermen and other users of the Refuge have been documented. At current use levels, fishing occurring concurrently with wildlife observation and photography, environmental education and interpretation on some areas of the Refuge does not appear to detrimentally impact these other uses. However, litter generated from fishing activities could negatively impact the visual experience of refuge visitors (Marion and Lime 1986). The Star Lake and 5-mile Cut areas of the Refuge are seasonally closed to fishing during the waterfowl season in order to limit potential conflicts between these two uses.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible.
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

This section identifies the restrictions and regulations necessary to ensure compatibility of fishing on McFaddin NWR.

Fishing and crabbing is allowed in designated areas of the Refuge in accordance with State regulations and subject to Refuge-specific conditions. Fishing and crabbing is permitted year-round in 10-Mile Cut, Mud Bayou, Mud Lake, and in and along the banks of Clam Lake. Five fishing piers along Clam Lake and a bridge on 10-Mile Cut provide access for those fishing from land. Anglers may also fish from the shoreline of the GIWW and along public roadside ditches throughout the year. Seasonal fishing opportunities are available in Star Lake and 5-Mile Cut between March 15th and August 31st.

Fishing is allowed using pole and line, rod and reel, or hand-held line only. Cast-netting for bait for personal use is permitted along waterways in areas open to the public and along public roads. Trotlines, set lines, jug lines, limb lines, bows and arrows, gigs, spears, and crab traps are prohibited. Fishing from or mooring to water control structures, and the harvesting of frogs and turtles, is prohibited. Harvesting fish or crabs for commercial purposes is prohibited.

Outboard motor boats, airboats, and non-motorized boats may be used to access Mud Bayou, Mud Lake, Star Lake, 10-mile cut and Clam Lake. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less, and engines may not exceed 2 cylinders and 484 cc. Non-motorized boats may be used to access 5-Mile Cut between March 15th and August 31st.

On inland waters of Refuge fishing areas open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through

emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of the Refuge will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on the 10-Mile Cut portion of Salt Bayou and on Mud Bayou. This grace period of 5 years is aimed to provide those anglers currently using boats with a horsepower greater than 25 ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

Five boat ramps are available on the Refuge for launching small, shallow-draft boats only. Boat ramps are located at Clam Lake (2), 10-Mile Cut, 5-Mile Cut and Star Lake.

Continued law enforcement patrols will be necessary to ensure compliance with these and State and Federal fishing regulations.

Justification:

Continuation of fishing and crabbing on the Refuge should not have any measurable effect on overall populations of aquatic species and the long-term viability of these species' populations. The Texas Parks and Wildlife Department regularly adopts regulations in response to fish population levels and management needs. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term. In addition, designated areas of the Refuge remain closed to the public to provide sanctuary areas for wildlife.

If fishing activity on McFaddin NWR increases substantially, additional stipulations may be needed to protect habitats and resources. Refuge staff will continue to monitor and evaluate use and associated impacts regularly.

Fishing is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Fishing has been a traditional form of outdoor recreation on the Refuge and in southeast Texas. When conducted in accordance with the stipulations listed herein, fishing would be compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andee J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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- Knight, R. L. 1984. Responses of wintering bald eagles to boating activity. *J. Wildl. Manage.* 48(3): 999-1004.
- Knight, R. L. and D. N. Cole. 1995. Wildlife responses to recreationalists. Pages 51-69 *in* R. L. Knight and K. J. Gutzwiller, ed. *Wildlife and Recreationalists: coexistence through management and research*. Island Press, Washington, D.C. 372pp.
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COMPATIBILITY DETERMINATION: MCFADDIN NWR - WILDLIFE OBSERVATION, PHOTOGRAPHY, ENVIRONMENTAL EDUCATION AND INTERPRETATION

Use: Wildlife Observation, Photography, Environmental Education and Interpretation

Refuge Name: McFaddin National Wildlife Refuge

County: Jefferson, Galveston and Chambers counties, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

McFaddin National Wildlife Refuge (NWR or Refuge) proposes to continue to provide wildlife observation, photography, environmental education and interpretation opportunities in designated areas of the Refuge that are compatible with Refuge purposes. These activities are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The continuation and enhancement of these programs will be addressed in this compatibility determination.

Wildlife Observation and Photography: Means of access for wildlife observation and photography opportunities on McFaddin NWR are supported by motorized vehicles, outboard motor boats, airboats, non-motorized boats, bicycles, horseback, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with wildlife observation and photography.

During FY02, approximately 1,150 visitors to McFaddin NWR participated in wildlife observation and photography activities. McFaddin NWR offers eight miles of graveled roads to view and photograph wildlife year-round along Clam Lake, the Gulf Intracoastal Waterway (GIWW), and adjacent marshes. All Refuge roads open to vehicle traffic are available for wildlife observation and photography, unless weather conditions make roads impassable. The Refuge is currently open daily to the 10-Mile Cut bridge from 6:00 am to sunset. Access beyond the bridge is available Monday through Friday from 7:30 am to 4:00 pm. A trail behind Refuge headquarters leads to Pond 11 and an observation deck, which is open to wildlife watchers and photographers seasonally outside of the waterfowl hunt season. Opportunities for wildlife observation and photography on McFaddin NWR are available year-round in Clam Lake, 10-Mile Cut, Mud Bayou, and Mud Lake from boats. Seasonal viewing opportunities are available in Star Lake

and 5-Mile Cut between March 15th and August 31st. Five boat ramps provide access to Star Lake, 5-Mile Cut, 10-Mile Cut and Clam Lake (2).

Other Non-priority Uses in Support of Wildlife Observation and Photography: Bicycling and horseback riding occur in very limited numbers on the Refuge. Bicycling in support of wildlife observation is permitted on roads open to motorized vehicles only. Because Refuge roads are gravel, conditions are not ideal for biking and use is therefore limited. Horseback riding in support of wildlife observation occurs very infrequently on the Refuge. Individuals interested in utilizing horses to view wildlife must stay on public roads open to motorized vehicles only. Horseback riding as an organized trail ride is prohibited.

Environmental Education and Interpretation: “Marsh Madness!”, an annual educational event held on the Refuge since 2003, promotes an awareness and understanding of the important natural resources found along the Texas Gulf coast. Interpretive tours and programs are also provided by Refuge staff to interested schools and organizations upon request.

Additional strategies to support wildlife observation, photography, environmental education and interpretation are identified under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP (USFWS 2007). These strategies include the addition of trails, information kiosks, interpretive signs and exhibits, an observation platform, photography blind, brochures, and interpretive tours. The development of educational programs for Sabine Pass schools and students are also included in these strategies. The USFWS also proposes to extend open hours beyond 10-Mile Cut to one hour before sunrise to one hour after sunset seven days a week to facilitate additional wildlife-dependent recreational opportunities.

Availability of Resources:

Direct annual costs to administer these programs and facilities are primarily in the form of staff time. The development of new facilities and programs, as well as the maintenance and upkeep of existing facilities and programs, will be the primary costs associated with wildlife observation, photography, environmental education and interpretation offered on the Refuge. Law enforcement support will continue to be necessary to ensure compliance with Refuge regulations. Additional funding will be required before the facilities and programs listed under Refuge Management Alternative D can be fully implemented. Refuge staff will pursue funding options through partnerships with other non-governmental organizations including the McFaddin and Texas Point Refuges Alliance, and pursue grants and matching funds to ensure that the strategies listed in Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain EIS/CCP/LPP (USFWS 2007) are implemented. Volunteer support will continue to be critical in the Refuge’s ability to fully implement the strategies listed under Refuge Management Alternative D.

Anticipated Impacts of Use(s):

The potential impacts of the McFaddin NWR wildlife observation, photography, environmental education and interpretation programs on the USFWS’ ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use the Refuge include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). It is expected that impacts to these species will be negligible. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast, though are seldom reported on McFaddin NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator

populations on and around the Refuge are currently at relatively high levels. Some disturbance to basking alligators may occur from visitor use. Overall, no impacts to Federally-listed Threatened and Endangered species populations are expected to occur due to Refuge visitors conducting wildlife observation, photography, environmental education or interpretation.

Primary means of access to areas on the Refuge used for wildlife observation and photography include motorized vehicles on Refuge roads open to the public, walking on trails and roads, and motorized and non-motorized boating. A very small number of visitors use bicycles on public roads. An even smaller number ride horses on roads. Motorized vehicles, walking, and motorized and non-motorized boats are used to access areas used for environmental education and interpretation on McFaddin NWR. Impacts associated with wildlife observation, photography, environmental education and interpretation activities vary based on mode of access. Walking, vehicles on roads, motorized and non-motorized boating, bicycling, and horseback riding all have the potential to disturb wildlife and influence distribution and habitat use.

Habitats: The greatest potential for impacts to vegetation resources and habitats likely comes from motorized boating activities. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species (i.e. giant salvinia, water hyacinth, etc).

Migratory Birds and other Biological Resources: Disturbance of wildlife by visitors is likely to be greatest in concentrated areas of use, including along trails, boardwalks, observation platforms and along roads (Klein 1993). While some species appear to acclimate to vehicular traffic, and even presence of visitors on trails, boardwalks, and observation platforms, other species are less tolerant of disturbance. Overall it is likely that species composition and abundance is decreased in areas supporting these recreational uses.

Disturbance impacts to birds from visitation are often magnified during the breeding season. Color of clothing worn can attract or repel different passerine species based on breeding plumages of those species (Gutzwiller and Marcum 1997). Primary song occurrence and consistency of certain passerines can be impacted by a single visitor (Gutzwiller *et al.* 1994). Human disturbance may also limit the number of breeding pairs and production of certain passerine species (Reijnen and Foppen 1994). Predation on songbird, raptor, colonial nesting species and waterfowl nests tends to increase near more frequently visited areas (Dwernychuk and Boag 1972, Buckley and Buckley 1978, Lenington 1979, Boyle and Samson 1985, Miller *et al.* 1998). Glinski (1976) suggests that attracting wildlife using taped vocalizations may increase energy expenditures of wildlife, disrupt territory establishment, and increase susceptibility to predation.

In general, activities that occur outside of vehicles (along walking trails, etc), tend to increase disturbance potential for most wildlife species (Burger 1981, Klein 1993, Gabrielsen and Smith 1995). In wetland habitats, disturbance from out of vehicle approaches can reduce the time spent foraging or even cause avoidance of areas disturbed (Klein 1993). Similarly, walking tends to displace birds and can cause localized declines in species richness and abundance (Riffell *et al.* 1996).

Walking with pets can cause additional disturbances to wildlife. Pets are known to both chase and kill wildlife (George 1974, Lowry and McArthur 1978). The greatest increase in heart rates of bighorn sheep occurred when approached by humans with a dog (MacArthur *et al.* 1982). Prairie chickens showed a stronger fear response to domestic dogs than to native predators such as foxes (Hamerstrom *et al.* 1965).

Vehicular use along Refuge roads can impact Refuge wildlife and habitats directly or indirectly. Vehicles can cause wildlife mortality through direct impact (Dowler and Swanson 1982, Adams and Geis 1983,

Rosen and Lowe 1994, Ashley and Robinson 1996). Reptiles are most likely to be impacted by vehicles as they sun themselves on or cross Refuge roads; however birds, mammals and amphibians are also susceptible. Vehicles can also cause disturbance to wildlife. Noise, vibration and visual stimuli may cause animals to avoid the vicinity of roads, and noise may mask communications (Busnel 1978, Zande *et al.* 1980, Reijnen and Foppen 1994, Spellerberg 1998). Although vehicles themselves can cause wildlife disturbance, wildlife often habituate to the presence of slow moving vehicles which ultimately can act as viewing blinds for those within.

Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

McFaddin NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife in areas outside of boating activity.

Impacts related to horseback riding may include exotic plant seed dispersal (Hammit and Cole 1987), soil compaction and erosion (Bainbridge 1974, Hammit and Cole 1987, Hendee *et al.* 1990) aesthetic concerns relative to horse manure (Lee 1975), direct wildlife disturbance (Owen 1973, Carlson and McLean 1996), and potential conflicts with other recreationalists. As horseback riding is limited to Refuge roads, and use is very low, these impacts are expected to be minimal.

A variety of regulations govern means of access to public use areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Disturbance impacts caused by wildlife photographers tend to be greater than other wildlife observation techniques (Klein 1993, Morton 1995, Dobb 1998). Photographers are much more likely to leave their vehicles and approach wildlife on foot (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers with low power lenses to get much closer to their subject than other activities would require (Morton 1995).

Litter improperly discarded by visitors can entangle wildlife or be ingested, potentially resulting in injury or death (Gregory 1991). Efforts to educate the public about such issues are incorporated into outreach efforts and educational programs.

The above impacts are minimized on the Refuge by locating public use facilities away from sensitive areas, restricting public access to existing roads and trails, and through the strategic placement of trails, observation decks, boardwalks, and photography blinds. While some disturbance impacts occur along these linear corridors, extensive tracts of undisturbed habitats remain available for wildlife in areas adjacent to public use facilities and throughout the Refuge. Additionally, impacts are minimized through development and active enforcement of refuge-specific rules and regulations, including seasonal closures and emergency closures if warranted, and through educational materials made available to the visiting public. As a result of active management of these wildlife-dependent recreational uses, direct, indirect

and cumulative impacts to migratory birds and other biological resources from these uses remain at acceptable levels and will not affect the viability of any fish, wildlife or plant population on the Refuge.

Other Wildlife-dependent Recreational Uses: A major goal of McFaddin NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. While all uses occur concurrently on some portions of the refuge open to the public, few conflicts between users have been documented. Where potential for conflicts or safety issues exists areas on the refuge open to hunting are seasonally closed to other uses. Public use trends and associated impacts from human activity will continue to be monitored on the Refuge. If significant increases in use are found, the program will be reevaluated.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Stipulations designed to ensure compatibility for wildlife observation, photography, environmental education and interpretive programs outlined in the description of use section should minimize impacts to a point where these activities would be compatible with the purposes established for McFaddin NWR.

Designated public use areas on McFaddin NWR will be open from one hour before sunrise to one hour after sunset daily.

Although wildlife observation, photography, environmental education and interpretation occur via several different modes of access, all visitors must stay on designated roads, trails or waterways. By concentrating disturbances to these designated areas, large areas of undisturbed habitat are still available for wildlife.

Designated trails will be open for wildlife observation and photography seasonally outside of waterfowl season.

Outboard motor boats, airboats, and non-motorized boats may be used to access Mud Bayou, Mud Lake, 10-Mile Cut and Clam Lake year-round, and seasonally between March 15th and August 31st on Star Lake. 5-Mile Cut is open for wildlife observation and photography via non-motorized boat only between March 15th and August 31st. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less, and engines may not exceed 2 cylinders and 484 cc. On inland waters of the Refuge open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of the Refuge will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on the 10-Mile Cut portion of Salt Bayou and on Mud Bayou. This grace period of 5 years is aimed to provide those visitors currently using boats with a horsepower greater than 25 ample time to prepare for this change in regulation. In areas where propellers are

damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

Five boat ramps are available on the Refuge for launching small, shallow-draft boats only. Boat ramps are located at Clam Lake (2), 10-Mile Cut, 5-Mile Cut and Star Lake.

Bicycling and horseback riding in support of wildlife observation is permitted on public roads open to motorized vehicles only. Horseback riding as an organized trail ride is prohibited.

Recordings to attract wildlife are prohibited. The collection of plants or animals, or feeding or disturbing wildlife, is prohibited. Pets must be leashed at all times.

Continued law enforcement patrols will be necessary to ensure compliance with these and State and Federal regulations.

Justification:

These programs are determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. Wildlife observation, photography, environmental education and interpretation are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Facilities and activities related to wildlife observation, photography, environmental education and interpretation occur in designated areas of the Refuge, leaving large areas of undisturbed habitat available for wildlife. The stipulations outlined above are specifically designed to and should minimize potential impacts of these activities. The Refuge will continue to monitor uses and adjust programs as necessary to protect Refuge resources. The educational benefits gained from these activities are expected to outweigh their associated impacts. Providing opportunities for wildlife observation, photography, environmental education and interpretation has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby further contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: MCFADDIN NWR – CONTROLLED LIVESTOCK GRAZING

Use: Controlled Livestock Grazing

Refuge Name: McFaddin National Wildlife Refuge

County: Jefferson, Galveston and Chambers counties, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act of 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

McFaddin National Wildlife Refuge (NWR) proposes to continue the controlled grazing program in designated areas that are compatible with Refuge purposes. Permittee cattle operations are an economic use of Refuge lands and provide a critical tool for Refuge management. This Compatibility Determination considers continuation of the controlled grazing program on the Refuge, and includes consideration of modifications to the program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Cattle grazing is an inexpensive, dependable, and effective tool used to accomplish Refuge goals, specifically for management of migratory birds including wintering and resident waterfowl, shorebirds and wading birds. Grazing is used to: 1) open up dense vegetation; 2) depress perennial plants; 3) encourage growth of annual grasses and sedges; and 4) reduce tall, rank grass types and encourage creeping grass species. This program is implemented to encourage a mosaic of heavily, moderately, and ungrazed areas to provide habitats in multiple successional stages on the Refuge.

The grazing program on McFaddin NWR is a cow-calf operation with some bulls introduced for breeding. The cow bloodline is a mixed breed of Zebu ancestry, with Brahma, Angus or Charolais bulls used for breeding. The majority of the habitat on McFaddin NWR is coastal marsh that is managed with cool-season grazing. Using a graze-rest strategy, permittees typically graze October through April. A small amount of warm season grazing is used in fresh water marshes to manage high successional situations. An average of 10,489 (range 4,778 – 14,275) animal unit months (AUMs) occurred annually on McFaddin NWR between FY 1998-2005. Grazing strategies include variations in stocking rates, timing (cool vs. warm season) and duration. Stocking rates and rotations are determined annually according to

management objectives for the various grazing units and the quantity and condition of forage in those units, and are often influenced by the availability of freshwater.

Grazing does not take place uniformly across units, particularly in coastal marshes. Cattle tend to concentrate grazing pressure adjacent to upland areas with decreased grazing pressure with increasing distance from high ground. Acres grazed and grazing pressure varies from year to year. In a typical year, cattle graze approximately 35,000 acres on McFaddin NWR.

Prescribed burning is an integral part of using cattle to meet management objectives. Fire can be used to create favorable foraging conditions for cattle and focus grazing pressure. Excluding high priority uplands, such as salty prairie sites, from burning can reduce grazing pressure where it is less desirable while focusing it on adjacent wetlands.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the grazing program at existing and projected levels. Costs associated with this activity are primarily staff time. Some additional expenses are incurred through site preparation required to protect grazing infrastructure from fire operations. The cost of new or replaced infrastructure is shared between the permittee and the USFWS.

Anticipated Impacts of Use:

Controlled grazing can be an effective and inexpensive tool in wetland and grassland management providing habitat components that benefit waterfowl and other wildlife species. The relation of cattle grazing to wildlife varies considerably, depending on stocking rate, seasonality, plant community, and wildlife concerned (Chabreck 1968). Research indicates that dual use of grasslands by wildlife and livestock is often compatible when livestock grazing is carefully managed and wildlife needs are considered (Holechek 1982).

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use Refuge habitats include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). It is expected that impacts to these species will be negligible. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast, though are seldom reported on McFaddin NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The grazing program should pose no threat to alligators on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of the grazing program on the Refuge.

Habitats: Grazing (integrated with fire and water management) in wetland habitats on the Refuge promotes the germination, growth and reproduction of several "early successional" target plant communities which are especially beneficial to migratory birds as food sources (Allen 1956, Gosselink *et al.* 1979). Target plant communities in intermediate and brackish marsh habitats on the Refuge include olney bulrush (*Scirpus americanus*), saltmarsh bulrush (*Scirpus robustus*), seashore paspalum (*Paspalum vaginatum*), seashore saltgrass (*Distichlis spicata*) and annual grasses including millets (*Echinochloa* spp.) and sprangletops (*Leptochloa* spp.), several sedges, and several annual forbs such as purple ammenia (*Ammania coccinea*). Moderate grazing following burns in marshes also prolongs the availability of new grass shoots, a valuable food for snow geese (Gosselink *et al.* 1979). Grazing also helps provide optimal physical structure of vegetation for waterfowl utilization in emergent marshes and other vegetated wetlands by creating openings in otherwise dense stands of vegetation and maintaining plant communities such as seashore paspalum which grow low to the ground. These conditions also

provide excellent habitat for many invertebrate species, another important food source for waterfowl and other migratory birds. Proper grazing of salty prairie seems to produce favorable nesting structure for Mottled Ducks.

Savory and Butterfield (1998) make an important distinction between what they call brittle and non-brittle landscapes. Brittleness is a term used to describe ecosystem resilience to disturbance and forms a continuum from brittle to non-brittle. Non-brittle environments have relatively high, evenly distributed rainfall, rapid recycling of nutrients through decaying plant and animal material and active microorganisms. Brittle environments tend to dry out quickly, have low nutrient recycling and low microorganism activity. Coastal marshes of the upper Texas coast are very much toward the non-brittle end of the spectrum. These marshes experience high annual rainfall distributed throughout the year, a long growing season, very fast nutrient recycling, and vegetation recovers quickly following disturbances. These conditions require protracted disturbance events, such as grazing, to maintain early successional conditions for any length of time.

Studies conducted on Sabine National Wildlife Refuge in Cameron Parish, Louisiana (Valentine 1961) determined that increased grazing can change tall climax marshhay cordgrass stands to more diverse community such as seashore paspalum, *Setaria*, and longtom (*Paspalum lividum*), that are more beneficial to certain types of wildlife. Depending on site conditions (elevation, soil, and hydrology) annual grasses and forbs (including millets, fall Panicum (*Panicum dichotomiflorum*), sprangletop, and *Setaria*) can be produced through proper grazing.

Pate (2001) found that grazed marshes remained in a sub-climax state, while habitat within grazing exclosures reverted to marshhay cordgrass. At the onset of the study *Spartina* spp. made up 20% of the plant community, while seashore paspalum comprised 80%. By the end of the study, communities within grazing exclosures changed to 65% *Spartina* spp. and 25% seashore paspalum. In contrast, the grazed area maintained high cover of seashore paspalum throughout the study. Seashore paspalum provides habitat for many species of waterfowl, wading birds and shorebirds, depending on hydrology, while marshhay cordgrass largely precludes these species.

The detrimental affects of grazing in coastal marsh environments includes the risk of overgrazing if units are not closely monitored, bank erosion, excessive trampling of vegetation, compaction of soils reducing percolation rates, and the deposition of nutrients in the form of manure in areas where livestock concentrate (USFWS 1994). Warm-season grazing of wetland areas can reduce seed production of annual grasses (Chabreck 1968).

Migratory Birds and Other Biological Resources: Proper grazing can promote habitat for snow geese, puddle ducks, Wilson's snipe and rails (Chabreck 1968). Chabreck notes that anything more than light grazing would be detrimental to muskrats. Yeagan (2001) determined that the number of shorebirds, herons and egrets was greater in grazed than ungrazed marshes on Galveston Island, Texas, while the number of gulls, terns, sparrows, rails and other species was not different. Mizell (1998) studied wintering yellow rails on Anahuac NWR and suggested that cattle grazing may increase availability of yellow rail habitat.

Management tools used to set back succession (grazing, fire, mechanical disturbance, and herbicides) benefit most wetland-dependent species. The extent to which these tools are applied can be detrimental to some species, while benefiting others. An example of this would be an intensive grazing regime that reduces emergent wetland vegetation, benefiting waterfowl, shorebirds and wadingbirds, but detrimental to species desiring ranker conditions, such as sedge wrens and seaside sparrows. In the practical application of a tool like grazing, the available herd is focused in certain areas to achieve the moderate grazing regime desired, leaving large areas lightly grazed or ungrazed to the benefit of the species desiring the cover of emergent vegetation. Neither intensive grazing nor the lack of grazing is desired over the whole Refuge. Rather, a mosaic of heavily, moderately, and ungrazed wetlands is the target of the grazing management program.

Wildlife-Dependent Recreational Uses: A major goal of McFaddin NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Conflicts can occur between these uses and the controlled livestock grazing program, but conflicts and potential safety issues are minimized through management which includes regular and recurring maintenance of infrastructure (fences, gates, and cattleguards). In addition, grazing is excluded from refuge units supporting trails, boardwalks, observation platforms and other infrastructure used for wildlife observation and photography, environmental education and interpretation. Grazing units and refuge hunt areas do overlap without negative impacts to either program.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The controlled grazing program provides the Refuge with a management tool to improve habitat quality for migratory birds. The grazing program must assist the Refuge in meeting management objectives.

The grazing program is governed through the issuance of Special Use Permits to permittees. Stipulations necessary to ensure compatibility with Refuge establishment purposes and the mission of the NWRS are included as the Special Conditions of the Special Use Permit. Permittees must adhere to all conditions set forth in Special Use Permit, including the following:

- Permittees will graze cattle in only designated locations of the Refuge. Stocking rates and pasture rotations will be specified by the Refuge Manager.
- The Refuge Manager must be notified in advance of any introduction or removal of cattle.
- Permittees must annually provide a written record of cattle numbers and movements on and off the Refuge.
- Fences, gates, and cattleguards must be maintained by the Permittee with materials provided by the Refuge.
- Permittees must comply with all state and federal livestock health laws.

Refuge staff and grazing permittees must continually monitor habitat conditions and communicate throughout the adaptive management cycle. Factors such as stocking rate, duration, and seasonality must be adjusted as necessary to meet Refuge objectives under changing environmental conditions. To be successful, all participants must understand successional relationships of plant communities and effects of decisions under changing environmental conditions to keep the program aligned with Refuge goals and management objectives. Both short- and long-term monitoring of grazing impacts on Refuge habitats is needed to guide this adaptive management approach.

Justification:

Prescribed cattle grazing is an inexpensive, dependable, and effective tool for managing habitats on McFaddin National Wildlife Refuge. Applications of other disturbance tools, such as fire, are strongly influenced by weather conditions and numerous regulatory restrictions and are less likely to be available

when needed. Grazing is a management tool that, in most instances, can be more dependably implemented to assist in creating sub-climax conditions. High, well-distributed rainfall, rapid decomposition and recycling of nutrients, and long growing seasons makes coastal marshes a less brittle ecosystem (Savory and Butterfield 1998). When properly managed, there are few detrimental effects of grazing coastal marshes, most being aesthetic in nature. When conducted in accordance with the stipulations listed herein, managed cattle grazing is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: MCFADDIN NWR – COMMERCIAL ALLIGATOR HARVEST

Use: Commercial Alligator Harvest

Refuge Name: McFaddin National Wildlife Refuge

County: Jefferson, Galveston and Chambers counties, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

The commercial harvest of American alligators (*Alligator mississippiensis*) is administered on the McFaddin National Wildlife Refuge (NWR or Refuge) as a compatible refuge economic use. Additionally, the alligator harvest program supports meeting migratory bird management objectives, specifically for Mottled Ducks (*Anas fulvigula*), and is considered important for protecting public safety and water management infrastructure. This Compatibility Determination considers continuation of commercial alligator harvest on the Refuge, and includes consideration of modifications to the Refuge commercial alligator harvest program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/ Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

An overall goal of the alligator harvest is to maintain a healthy alligator populations, at densities consistent with the primary establishment propose of the Refuge. Under this goal, the specific objectives include:

1. Maintain overall alligator population age structure which maintains natural alligator social structure. Social structure and related interactions may be an important mechanism affecting overall alligator population dynamics by affecting recruitment and survival, influencing factors such as fecundity (reproductive age, clutch sizes and egg viability), overall breeding densities, and rates of cannibalism by adults on juvenile and subadult alligators.
2. Maintain alligator population density and distribution consistent with meeting population objectives for Mottled Ducks, a resident waterfowl species for which wetlands on the Refuge provide key nesting, brood-rearing and molting habitats.
3. Maintain alligator population density and distribution consistent with providing the public with opportunities for compatible wildlife-dependent recreational opportunities, specifically wildlife observation, photography, environmental education and interpretation.

4. Minimize adverse risks to public safety by minimizing the potential for negative alligator-human conflicts. This involves both public education and when necessary, removal of alligators from locations where conflicts are occurring or are likely to occur.
5. Maintain alligator population density consistent with acceptable levels of damage to water management infrastructure including levees and water control structures.

The Refuge alligator harvest program is conducted under the regulatory frameworks established by the State of Texas Alligator Management Program, administered by the Texas Parks and Wildlife Department (TPWD). In addition to establishing licensing requirements and harvest regulations, the TPWD annually determines the number and allocates hide tags to the Refuge (and other participating landowners). This annual allocation is based on alligator densities per designated habitat type, as indexed by the annual aerial nesting surveys, supplemented by nighttime spotlight surveys when available.

Individuals participating in the Refuge alligator harvest program are chosen randomly from a qualified group of applicants, and are issued Refuge Special Use Permits (SUP). The SUP contains special provisions and conditions which detail refuge-specific regulations and requirements governing alligator harvest on the Refuge.

Permittees are assigned specific target areas to remove alligators. These areas include moist soil units, reservoirs and areas within marsh units which are especially important as Mottled Duck brooding and molting habitats and adjacent canals and ditches. Selected areas where alligators are in frequent contact with the public and where there is potential for alligators to damage levees and other Refuge infrastructure are also targeted.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the commercial alligator harvest at existing and projected levels. Costs associated with this activity are primarily staff time.

Anticipated Impacts of Use:

The most direct effect of the commercial alligator harvest program on the Refuge is the mortality of harvested alligators. From 1998-2006, annual harvest on the Refuge has ranged from (Table 1). This program is administered under regulations promulgated by Texas Parks and Wildlife Department, and these regulations are designed to ensure that viable alligator populations are sustained over the long-term. Continuation of the commercial alligator harvest program should not have any measurable effect on the long-term viability of alligator populations on the Refuge.

Threatened and Endangered Species: Federally-listed Endangered or Threatened species known to use the Refuge hunt units include bald eagle (*Haliaeetus leucocephalus*, threatened), brown pelican (*Pelecanus occidentalis*, endangered), piping plover (*Charadrius melodus*, threatened), and American alligator (threatened). It is expected that impacts to populations of these species will be negligible. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are sometimes observed flying over the Refuge and along the shoreline of East Bay. Piping plovers winter primarily along the Texas Gulf Coast, though are seldom reported on McFaddin NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands.

American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The most direct effect of the commercial alligator harvest program on the Refuge is the mortality of harvested alligators. From 1998-2006, annual harvest on the Refuge has ranged from 120 to 339 alligators (Table 1). This program is administered under regulations promulgated by Texas Parks and Wildlife Department, and these regulations are designed to ensure that viable alligator populations are sustained over the long-term. Continuation of the commercial alligator harvest program should not have any measurable effect on the long-term viability of alligator

Table E-4. Alligator harvest on McFaddin NWR, 1998 – 2006.

Year	Number Alligators Harvested		
	Male	Female	Total
1998	73	66	139
1999	61	59	120
2000	106	57	163
2001	120	121	241
2002	174	165	339
2003	145	134	279
2004	113	139	252
2005	80	85	165
2006	84	142	226

populations on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of commercial alligator harvest on the Refuge.

In the late 1990's, harvest trends and some nighttime survey data suggested that that the number of mature adult alligators on the Refuge was decreasing in harvested areas. To counter this trend, the USFWS worked to increase the percentage of subadult alligators in the harvest through a variety of means in order to reduce harvest pressure on mature adult alligators. Primarily because the traditional and most commonly used harvest methodology, the baited hook and line set overnight, is non-selective, these efforts were only moderately successful. A second factor limiting success is economic in nature. Subadult alligators are lower in value per foot in Texas, and the higher prices being paid by Texas commercial buyers/processors for the larger adult alligators creates an incentive for permittees to harvest larger adult alligators and a disincentive to harvest the smaller subadult alligators.

In recent years, administration of the alligator harvest program on the Refuge has been further modified to increase the percentage of subadult alligators in the overall harvest, and concurrently decrease harvest of the larger adult alligators. This is being accomplished by implementing experimental alligator harvest programs in cooperation with the TPWD, utilizing the Management Hide Tags available through the Texas Alligator Management Program for harvest of subadult alligators. Subadult alligators are considered to be those alligators 6' and less in length. The short-term goal is to ensure that subadult alligators comprise a minimum of 50% of the overall harvest on the Refuge, with a long-term goal for the harvest program is for subadult alligators to comprise a minimum of 70% of the annual harvest. Allocations of Management Hide Tags and the traditional CITES Hide Tags to Refuge permittees are geared toward meeting this new harvest objective.

The experimental harvest is conducted by Refuge permittees during the regular alligator season, using only TPWD-approved selective harvest methodologies. These include: 1) baited wooden dowel and line; 2) line with grappling hook; 3) bow and arrow; 4) baited hook and line only when permittee is present and fishing for a specific subadult alligator.

Since implementing the experimental harvest in 2004, harvest of subadult alligators has increased substantially, and now represents approximately 58% of overall harvest on the Refuge. Alligators less than 7' in length now constitute nearly 80% of the harvest. Alligators greater than 7' in length now comprise only 20% of the harvest. This harvest strategy is expected to help ensure that the Refuge alligator population maintains a natural age distribution and social structure.

Migratory Birds and other Biological Resources: Commercial harvest of alligators could result in some disturbance to wildlife adjacent to hunted areas, especially those areas associated with canals. Some trampling of vegetation may also occur near harvest sites. However, it is anticipated that this disturbance would be minimal. If improperly managed, the harvest could negatively impact wildlife observation opportunities in public-use areas.

Various studies report differing predation rates on various types of wildlife (Giles and Childs 1949, Valentine *et al.* 1972, Eley *et al.* 2004). . The mixed results of these studies are likely a result of varying seasonality, habitat, and prey availability. McNease and Joanen (1977) reported that alligator diets are mainly determined by availability and vulnerability of the prey species. Eley *et al.*, (2004) reported a relatively high frequency (20.9%) of Mottled Ducks in alligator stomachs taken from animals present in preferred Mottled Duck habitat with broods and molting birds present. This study indicates that alligators may have a deleterious effect on Mottled Ducks in certain habitats during certain phases of their life cycle (primarily flightless molting birds and broods). Additionally, this study found that smaller alligators consumed Mottled Ducks while larger alligators did not. Based on these data it is expected that managing the commercial alligator harvest to focus on smaller alligators and harvest in areas with high Mottled Duck use will have a beneficial impact on Mottled Duck viability on the Refuge.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The commercial harvest of alligators provides the Refuge with a management tool to improve habitat quality for target organisms while ensuring the long term viability of alligator populations. The harvest program must remain consistent with ensuring the conservation of alligators and assist the Refuge in meeting Refuge management objectives. The commercial alligator harvest program is governed through the issuance of Special Use Permits to approved permittees. Stipulations necessary to ensure compatibility with Refuge establishment purposes and the mission of the NWRS are included as the Special Conditions of the Special Use Permit. These include the following stipulations aimed at ensuring protection of Refuge resources and public safety:

- Permittee and their assistants must follow all State and Federal laws regarding alligator harvest as well as all conditions stated in the Special Use Permit. Violation of any Federal, State, or Refuge regulation, or of any special condition of the SUP will result in immediate revocation of the SUP.
- Permittees must be experienced and pre-qualified to participate in this program. Final approval of eligibility rests with the U.S. Fish and Wildlife Service.
- No hunting will be allowed within 100 yards of a known alligator nest.
- Each Permittee may only take as many alligators as they are assigned tags. Within the frameworks set by the Texas Parks and Wildlife Department, harvest quotas for each Permittee will be set by the Refuge Manager, including harvest targets for subadult alligators.
- Permittees must take alligators only from designated areas as assigned by the Refuge Manager.
- Permittees must check sets and/or attempt to harvest alligators using approved methods on a daily basis until all tags are used.
- Allowed modes of motorized access will be specified by the Refuge Manager on an area-by-area basis.
- Permittee may only take alligators by using methods approved by the Texas Parks and Wildlife Department. Wildlife is not permitted to be used as bait.

- All alligators on hook and line sets will be killed immediately. Each alligator must be tagged immediately after being killed. Transport of an untagged alligator is prohibited.
- Firearms (minimum caliber of 22 magnum) may only be used to kill hooked alligators. If shotguns are used, only federally approved non-toxic shot will be permitted. All weapons must be unloaded and encased while in Refuge parking areas, boat launches, or in route to and from designated harvest areas.
- No alligator sets will be allowed in areas that jeopardize public safety.

Compliance with these and all other Special Conditions of the Special Use Permit is necessary to ensure the compatibility of the commercial alligator harvest program.

Justification:

The commercial harvest of alligators is managed on the McFaddin NWR so as to ensure the long-term conservation of healthy alligator populations, while providing the Refuge with a management tool to help meet migratory bird management objectives, protect important management infrastructure, and protect public safety. This program is administered under regulations promulgated by Texas Parks and Wildlife Department, and these regulations are designed to ensure that viable alligator populations are sustained over the long-term. In addition, the USFWS regulates the alligator harvest program on the Refuge through issuance of a Special Use Permit which contains stipulations also designed to conserve alligator populations and best meet management objectives. For example, special regulations are in place to restrict harvest of reproductive-aged alligators and maintain a natural age structure within the Refuge alligator population. Continuation of the commercial alligator harvest program should not have any measurable effect on the long-term viability of alligator populations on the Refuge. When conducted in accordance with the stipulations listed herein, the commercial alligator harvest program is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andee J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: TEXAS POINT NWR – WATERFOWL HUNTING

Use: Waterfowl Hunting

Refuge Name: Texas Point National Wildlife Refuge

County: Jefferson County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Texas Point National Wildlife Refuge (NWR or Refuge) proposes to continue to provide waterfowl hunting opportunities (for ducks, geese, and coots) in designated areas that are compatible with Refuge purposes. Hunting is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Waterfowl hunting is a long-standing traditional use on and around Texas Point NWR. This Compatibility Determination considers continuation of waterfowl hunting on the Refuge, and includes consideration of modifications to the Refuge hunting program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/ Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Waterfowl hunting on Texas Point NWR is supported by several modes of access, including outboard motor boats, airboats, non-motorized boats, bicycles, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with waterfowl hunting.

Opportunities for waterfowl hunting on Texas Point NWR will be available within the season set by Texas Parks and Wildlife Department in compliance with annually published regulations. Designated hunting areas will be open during established State waterfowl seasons, with the exception that hunting for ducks and coots will not be allowed on the Refuge until the last Saturday in October (not including the September teal and youth-only seasons). If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date. All applicable State and Federal regulations are enforced.

The waterfowl hunting season generally falls within the period September to February. Traditionally, the hunting season on the Texas coast begins in September with the early teal season. The regular waterfowl season follows, often beginning in late October and running through January.

Approximately 3,400 acres of the Refuge are open to waterfowl hunting on Texas Point NWR. The hunt unit consists primarily of coastal marsh habitats, including saline, brackish and intermediate marshes.

Designated areas of the Refuge are open for waterfowl hunting daily during the early teal season, and on Saturdays, Mondays and Wednesdays of the regular waterfowl season. The Refuge hunt unit is closed on Thanksgiving, Christmas and New Year's Day.

Hunters may enter the Refuge hunt unit between 4:00 am and ½ hour before shooting time. All hunts are morning-only hunts. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm.

A waterfowl hunting permit must be signed and in the possession of the hunter while hunting on the Refuge. This permit is available at no charge and serves to inform the hunter of Refuge-specific regulations. In Fiscal Year 2002, approximately 1,500 hunters utilized the Refuge for waterfowl hunting.

Waterfowl hunting is a long and established tradition in the coastal marshes of southeast Texas, and occurred on Refuge lands long before the establishment of the Refuge. Additional public waterfowl hunting opportunities exist in the area at the State managed J.D. Murphree Wildlife Management Area, the Wallisville Lake Project managed by the U.S. Army Corps of Engineers, and the McFaddin, Anahuac and Sabine National Wildlife Refuges managed by the U.S. Fish and Wildlife Service. 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.

Availability of Resources:

Costs to administer the hunt program will mostly be salaries and facilities maintenance. This would include law enforcement throughout the season by Refuge law enforcement staff, as well as sign posting, development and publishing of Refuge-specific regulations and permits, and responding to public inquiries and requests for permits. Existing facilities requiring maintenance and upkeep include parking areas and portable restrooms. The length of the season as determined annually by the State may result in an increase or decrease in the number of staff days required to administer the program. Base funding will be needed to manage the program. In addition to season length, hunter trends, either up or down, will result in an increase or decrease in staffing needed.

Anticipated Impacts of Use:

The potential impacts of the Texas Point NWR waterfowl hunt program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use the Refuge hunt units during waterfowl season include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl that occurred on the Refuge. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast and are regularly reported on Texas Point NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. The waterfowl hunt program should pose no threat to alligators on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of waterfowl hunting on the Refuge.

Habitats: The greatest potential for impacts to vegetation resources and habitats on the Refuge likely comes from motorized boating activities. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species.

Foot traffic in areas open to hunting can lead to vegetation trampling, and in heavy use areas, cause plant mortality. Some vegetation trampling and trailing from hunter foot traffic occurs in marsh habitats in hunt areas, although these impacts tend to be short-term.

These impacts are expected to be localized and minimal. Regulations, including motorboat and horsepower restrictions are used to protect wetland habitats and public safety.

Migratory Birds and Other Biological Resources: The most direct effect of hunting on the Refuge is the mortality of harvested waterfowl species resulting from hunting activities. Regulations governing harvest in states in the Central and Mississippi Flyways are developed annually through the Federal framework process for harvest of migratory birds in the U.S. This process is designed to ensure that viable waterfowl populations are sustained over the long-term. Overall, harvest on the Refuge, and cumulatively on all national wildlife refuges open to migratory bird hunting, constitutes a very small percentage of the overall harvest of migratory birds in these Flyways. The continuation of the waterfowl hunting program on the Refuge under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP (USFWS 2007) will not have any measurable effect on overall populations of hunted waterfowl species and the long-term viability of these populations.

Many studies have documented the effects of hunting intensity on the number of birds utilizing an area (Madsen *et al.* 1992 as cited by Fox and Madsen 1997). This study demonstrated that relatively light hunting pressure can reduce waterfowl abundance in hunted areas. Distribution and habitat use, feeding patterns, and the nutritional status of waterfowl have also been shown to be affected by hunting activities. Hunting activity can cause birds to alter habitat use, change feeding locations (Madsen 1995), feed more at night (Thornburg 1973, Morton *et al.* 1989) and reduce the amount of time spent feeding (Korschgen *et al.* 1985, Madsen 1995). Collectively, these changes in behavior have the potential to adversely impact the nutritional status of waterfowl (Bélanger and Bédard 1995).

Hunting may have a more significant impact on resident Mottled Ducks. Pair bonds for Mottled Ducks begin earlier than northern nesting birds and disturbance caused by hunting may disrupt the reproductive cycle for this species. Additionally, opening the regular waterfowl season before the arrival of migrating ducks from northern breeding areas allows for disproportionate harvest of resident birds, primarily Mottled Ducks. Refuge-specific regulations prohibit the opening of the general waterfowl season on the Refuge any earlier than the third Saturday in October in order to prevent this impact.

It has been shown that sanctuary areas on the wintering grounds are effective in maintaining local waterfowl populations in a landscape subject to hunting pressure (Bellrose 1954, Madsen 1998). Heitmeyer and Raveling (1988) found that waterfowl used sanctuaries during the day and local rice fields at night. Similarly, Fleskes *et al.* (2005) found northern pintail used areas closed to hunting during the day and dispersed throughout the area at night. These data indicate that while sanctuaries are effective in maintaining local waterfowl populations through the hunting season, birds must disperse at night to feed.

Sanctuary areas tend to support greater numbers of waterfowl the longer they have been established. Bellrose (1954) found that traditional sanctuary areas support higher populations of migrating ducks than newly established sanctuary areas. Similarly, Madsen (1998) found that it took two to six years between the creation of sanctuary areas and the time when peak numbers of dabbling ducks were reached.

These data indicate that traditional, long-term sanctuary areas are more valuable to maintaining local waterfowl populations than sanctuary areas that shift from year to year.

Presumably, providing waterfowl with predictable undisturbed sanctuary areas increases the ability of birds to meet the obligations of their annual cycle. Waterfowl undergo considerable physiological demands during winter. Heitmeyer (1988) estimated that prebasic molt in female mallards required an additional three grams per day of protein over base metabolic rates. These demands approach the estimated five grams per day associated with reproduction. Pair formation for most North American waterfowl takes place away from the breeding grounds. Waterfowl must accumulate endogenous energy reserves to meet the demands of courtship (Afton and Saylor in Baldassarre and Bolen 1994). Baldassarre and Bolen (1994) proposed that birds that do not accumulate energy reserves may have less time and energy at their disposal to initiate courtship and/or may be unable to maintain previously established pair bonds. Clearly, birds must meet high energy demands to successfully fulfill critical wintering components of their annual cycle. Further, Heitmeyer and Fredrickson (1981) build a scenario where endogenous reserves established on wintering grounds return mallards to breeding areas in better condition to begin nesting, leading to larger clutch sized and earlier nests, which tend to be more successful. Providing sanctuary areas of adequate size adjacent to quality feeding areas may contribute to the ability of birds to meet the physiological demands required during winter and possibly the subsequent nesting cycle.

The size, location and habitat quality of sanctuary areas on the Refuge remains critically important to ensure that migrating and wintering populations of waterfowl maintain sound nutritional and physiological status. Overall, it is expected that the maintenance of traditional sanctuary areas on the Refuge adequately mitigates for impacts from hunting activities. In years of particularly poor habitat quality due to climatic extremes or tidal flooding from tropical disturbances, however, it is possible that hunting activities would result in reduced abundance of wintering waterfowl on the Refuge.

Although the impacts of waterfowl hunting on wetland-dependent migratory and resident birds which are not hunted is likely less than for waterfowl, studies have demonstrated that hunting (including accessing hunt areas) does affect abundance and distribution of these other avian species. The noise associated with shooting likely reduces habitat utilization by shorebirds, wading birds, other marsh and waterbirds, and landbirds using wetland habitats within hunt areas, at least while hunting is occurring.

Incidental take of other wildlife species, either illegally or unintentionally, may occur with any consumptive use program. At current and anticipated public use levels and based on past history, incidental take is expected to be small and will not directly or cumulatively impact current or future populations of wildlife on the Refuge.

Means of access to and within Refuge hunt areas include motorized boating (primarily in Texas Bayou), non-motorized boating, walking, and bicycling (levee only). Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Texas Point NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife in areas outside of boating activity.

A variety of regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Other Wildlife-dependent Recreational Uses: A major goal of Texas Point NWR is to provide opportunities for wildlife-dependent recreation. Few conflicts among users of the Refuge have been documented in relation to waterfowl hunting. Although refuge hunt units are open for the other uses, natural spatial and temporal separations between recreational users of the Refuge minimize conflicts. Anglers fishing or crabbing on the Refuge typically utilize different habitats than those utilized by waterfowl hunters and waterfowl. Anglers most often prefer deeper waters, and are more active in the warmer months outside of the waterfowl season. Most visits for wildlife observation and photography, environmental education and interpretation occur in the spring, outside of waterfowl hunting season.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To reduce the impact of hunting on the resident Mottled Duck, modifications may be placed on opening dates for the regular waterfowl season. Season dates on the Refuge will be concurrent with Texas Parks and Wildlife Department for the September teal season, youth-only season, and duck and coot regular season in the Texas South Zone, and goose regular season in the Texas East Zone, with the exception that hunting for duck (not including the September teal and youth-only seasons) and coot will not be allowed on the Refuge until the last Saturday in October. If the State-specified duck and coot regular season opens later than the last Saturday in October, then hunting on the Refuge will open consistent with the State-specified season date.

All waterfowl hunters must follow the stipulations set forth in the waterfowl hunting regulations published annually by the Refuge.

Portions of Texas Point NWR will be open for waterfowl hunting daily during the early teal season, and three days a week (Saturdays, Mondays, and Wednesdays) of the regular waterfowl season. All hunts are morning-only hunts. Hunters may enter Refuge hunt units between 4:00 am and ½ hour before shooting time. Hunting is permitted from legal shooting time (1/2 hour before sunrise) until 12:00 pm. Hunters must be off the Refuge hunt units by 12:30 pm. All other portions of the Refuge are closed to waterfowl hunting. Long-term, traditional sanctuary areas will remain as sanctuary, with no public access.

Access into hunt areas may be by foot, bicycle, non-motorized boat, outboard motor boat, or airboat. Bicycles are permitted on the levee only. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less and engines may not exceed 2 cylinders and 484cc. Boat access is permitted only through Texas Bayou and associated waterways. On inland waters of Refuge hunt areas open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single

engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of Refuge hunt units will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on Texas Bayou. This grace period of 5 years is aimed to provide those hunters currently using boats with a horsepower greater than 25 ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

No limits are currently in place for numbers of hunters or parties waterfowl hunting on Texas Point NWR. Past history indicates that hunter use on Texas Point NWR is relatively low.

The use of retrieving dogs will continue to be allowed and encouraged in all areas open to waterfowl hunting for the conservation of downed birds. Dogs must be under the control of handlers at all times.

The Refuge will maintain an active law enforcement presence in an effort to maximize compliance with State and Federal waterfowl hunting regulations. Annual monitoring of hunter use and impacts will be implemented. The information gathered will be used to review and possibly revise hunting regulations to enhance the quality and safety of the Refuge's hunting program, and to ensure that waterfowl hunting activities will continue to be compatible with Refuge purposes and the mission of the National Wildlife Refuge System.

Justification:

The Texas Point NWR waterfowl hunting program is determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. The Refuge provides quality waterfowl habitats for thousands of migratory birds annually. Migratory bird populations and harvest parameters are monitored and managed on a flyway basis and are designed to ensure the long-term sustainability of populations. Additionally, the hunt program on the Refuge is specifically designed to provide quality public hunting opportunities while minimizing potential impacts to local populations of migratory birds and their habitats.

Refuge-specific regulations are in place to minimize potential adverse impacts from hunting-related disturbance to wildlife and habitats. Regulations govern means of access to hunt areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. Of critical importance is the USFWS' ability to manage and maintain traditional sanctuary areas. The Refuge will continue to monitor hunter use, compliance with rules and regulations, and impacts to waterfowl and other wildlife and use this information to adjust the waterfowl hunt program as necessary to protect Refuge resources.

Hunting is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Waterfowl hunting is a long-standing traditional use on and around Texas Point NWR, and has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby ultimately contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andee J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: TEXAS POINT NWR - FISHING

Use: Fishing
Refuge Name: Texas Point National Wildlife Refuge
County: Jefferson County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Texas Point National Wildlife Refuge (NWR or Refuge) proposes to continue to provide fishing opportunities in designated areas that are compatible with Refuge purposes. Fishing is a wildlife-dependent, priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. It is a wildlife-oriented recreational use and a traditional use of Texas Point NWR. This Compatibility Determination considers continuation of fishing on the Refuge, and includes consideration of modifications to the Refuge fishing program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Fishing on Texas Point NWR is supported by several modes of access, including outboard motor boats, airboats, non-motorized boats, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with fishing.

Texas Point NWR provides saltwater fishing opportunities year-round via boat in Texas Bayou and associated tributaries, as well as from roadside edges bordering the Refuge. Refuge fishing areas are open from one hour before sunrise to one hour after sunset daily. Blue crab, alligator gar, flounder, and red drum are just some of the species that anglers may catch while fishing on the Refuge. Shallow water boats can launch at a private dock at Texas Bayou, or from the nearby Dick Dowling State Park for a small fee (as of June 2006, Dick Dowling State Park remains closed due to the effects of Hurricane Rita). Personal watercraft are prohibited from the Refuge. During Fiscal Year 2002, approximately 5,475 anglers utilized the Refuge for fishing.

The USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge EIS/CCP/LPP proposes to coordinate and partner with local, county and state agencies to improve a primitive boat launching area off Pilot Station Road in Sabine Pass, to improve boat access to

Texas Bayou and the Refuge. In addition, the Refuge proposes to increase interpretive materials regarding fishery resources found on the Refuge.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage wildlife-dependent recreational fishing activities at existing and projected levels. Costs associated with this activity are primarily staff time. Refuge law enforcement officers regularly check anglers and crabbers for compliance with State and Refuge regulations. Additional funds would be needed to implement the proposed strategies listed under Refuge Management Alternative D of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP. The Refuge would pursue a variety of funding sources in order to fully support this use, including agreements with other agencies, and grant funding and volunteer assistance.

Anticipated Impacts of the Use:

The potential impacts of the Texas Point NWR fishing program on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use Refuge habitats include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl that occurred on the Refuge. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast and are regularly reported on Texas Point NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Fishing activities may pose a potential conflict with American alligators, which are attracted to bait used by anglers. Alligators can become accustomed to the presence of anglers and the associated food source, thereby reducing their natural fear of humans and potentially creating a safety hazard. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of fishing on the Refuge.

Habitats: The greatest potential for impacts to vegetation resources and habitats likely comes from motorized boating activities. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species.

Foot traffic in areas open to fishing can lead to vegetation trampling. In heavy use areas, this may cause plant mortality and subsequent erosion along shoreline areas (Liddle and Scorgie 1980, Hendee *et al.* 1990).

Fishery Resources: The most direct effect of fishing on the Refuge is the mortality of harvested saltwater fish, blue crabs, and several fish and shellfish species caught for use as bait. Fishing and crabbing on the Refuge occur under regulations promulgated by Texas Parks and Wildlife Department. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term. Continuation of fishing and crabbing on the Refuge should not have any measurable effect on overall populations and the long-term viability of these species' populations.

Similarly, the potential exists for over-harvest or illegal harvest of fisheries. Regular law enforcement patrols to ensure compliance with State and Federal regulations will assist in minimizing these potential impacts.

Migratory Birds and other Biological Resources: Some disturbance to wildlife from fishing activities is also expected. Fishing activities may influence the composition of bird communities (Tydeman 1977), as well as distribution, abundance, and productivity of waterbirds (Bell and Austin 1985). Jahn and Hunt (1964 as cited by Dahlgren and Korschgen 1992) reported that increases in recreational activity by anglers, boaters, and shoreline activity appeared to discourage breeding ducks and coots from using otherwise suitable habitat. Bell and Austin (1985) suggested that anglers fishing from the shoreline and boats displaced waterfowl from their preferred feeding and roosting areas and caused wigeon, green-winged teal, pochard and mallard to depart from a 174 ha reservoir prematurely. Cooke (1987) also documented that anglers on the bank and in boats often fished the shallow, sheltered bays and creeks that birds favor and negatively impacted distribution and abundance of waterfowl, grebes, and Eurasian coots. Cooke (1977 as cited by Liddle and Scorgie 1980) suggested that anglers create an area around them within which birds will not venture. Thus, an angler sitting on the shore can effectively exclude birds from his immediate vicinity. Some disturbance of roosting and feeding shorebirds probably occurs (Burger 1981) but is considered minimal.

Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Texas Point NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife outside of areas open to boating.

Discarded fishing line and other fishing litter can entangle migratory birds and other wildlife and cause injury or death (Thompson 1969, Gregory 1991).

A variety of regulations govern means of access to public fishing areas, including boat motor and horsepower restrictions. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Other Wildlife-dependent Recreational Uses: A major goal of Texas Point NWR is to provide opportunities for wildlife-dependent recreation. Few conflicts among users of the Refuge have been documented in relation to fishing. Natural spatial and temporal separations between recreational users of the Refuge minimize conflicts. Anglers fishing or crabbing on the Refuge typically utilize different habitats than those utilized by waterfowl hunters and waterfowl. Anglers most often prefer deeper waters, and are more active in the warmer months outside of the waterfowl season. Most visits for wildlife observation and photography, environmental education and interpretation also occur in the spring, but are concentrated along established trails in small refuge woodlands.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible.
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

This section identifies the restrictions and regulations necessary to ensure compatibility of fishing on Texas Point NWR.

Fishing and crabbing is allowed in designated areas of the Refuge in accordance with State regulations and subject to Refuge-specific conditions. Fishing and crabbing is permitted year-round via boat in Texas Bayou and associated tributaries, as well as from roadside edges bordering the Refuge. Refuge fishing areas are open from one hour before sunrise to one hour after sunset daily.

Fishing is allowed using pole and line, rod and reel, or hand-held line only. Cast-netting for bait for personal use is permitted along waterways in areas open to the public. Trotlines, set lines, jug lines, limb lines, bows and arrows, gigs, spears, and crab traps are prohibited. Fishing from or mooring to water control structures, and the harvesting of frogs and turtles, is prohibited. Harvesting fish or crabs for commercial purposes is prohibited.

Outboard motor boats, airboats, and non-motorized boats may be used to access fishing areas in Texas Point NWR. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less, and engines may not exceed 2 cylinders and 484 cc. On inland waters of Refuge fishing areas open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of the Refuge will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on Texas Bayou. This grace period of 5 years is aimed to provide those anglers currently using boats with a horsepower greater than 25 ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

Shallow water boats can launch at a private dock at Texas Bayou, or from the nearby Dick Dowling State Park for a small fee.

Continued law enforcement patrols will be necessary to ensure compliance with these and State and Federal fishing regulations.

Justification:

Continuation of fishing and crabbing on the Refuge should not have any measurable effect on overall populations of aquatic species and the long-term viability of these species' populations. The Texas Parks and Wildlife Department regularly adopts regulations in response to fish population levels and

management needs. These regulations are designed to ensure that viable fish and shellfish populations are sustained over the long-term. In addition, designated areas of the Refuge remain closed to the public to provide sanctuary areas for wildlife.

If fishing activity on Texas Point NWR increases substantially, additional stipulations may be needed to protect habitats and resources. Refuge staff will continue to monitor and evaluate use and associated impacts regularly.

Fishing is a priority wildlife-dependent public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Fishing has been a traditional form of outdoor recreation on the Refuge and in southeast Texas. When conducted in accordance with the stipulations listed herein, fishing would be compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Spence 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: TEXAS POINT NWR - WILDLIFE OBSERVATION, PHOTOGRAPHY, ENVIRONMENTAL EDUCATION AND INTERPRETATION

Use: Wildlife Observation, Photography, Environmental Education and Interpretation

Refuge Name: Texas Point National Wildlife Refuge

County: Jefferson County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Texas Point National Wildlife Refuge (NWR or Refuge) proposes to continue to provide wildlife observation, photography, environmental education and interpretation opportunities in designated areas of the Refuge that are compatible with Refuge purposes. These activities are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The continuation and enhancement of these programs will be addressed in this compatibility determination.

Wildlife observation and photography on Texas Point NWR are supported by several modes of access, including outboard motor boats, airboats, non-motorized boats, bicycles, and by foot. Because they are highly interrelated, this compatibility determination includes an assessment of these other activities in conjunction with wildlife observation and photography.

Designated areas of the Refuge are open to wildlife observation, photography, environmental education and interpretation year-round from one hour before sunrise to one hour after sunset. They include a primitive ¼ mile trail through a small woodland providing viewing opportunities for migrant songbirds in the spring and fall, and a two mile levee extending south from the parking area south of Highway 87 providing viewing opportunities in surrounding Refuge marshes. City roads south of Sabine Pass and adjacent to the marshes of Texas Point NWR provide similar opportunities to look and listen for secretive rails, wrens, and sparrows, as well as flocks of wintering waterfowl. Opportunities for wildlife observation and photography are also available from boat in Texas Bayou and associated tributaries. Limited environmental education and interpretation currently occur on the Refuge. During fiscal year 2002, approximately 250 visitors to Texas Point NWR participated in wildlife observation and photography activities on the Refuge.

Additional strategies to support wildlife observation, photography, environmental education and interpretation are identified under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007). These strategies include the addition of a trail, information kiosk, interpretive signs, brochures, and interpretive tours. The development of educational programs for Sabine Pass schools and students is also included in these strategies.

Availability of Resources:

Direct annual costs to administer these programs and facilities are primarily in the form of staff time. The development of new facilities and programs, as well as the maintenance and upkeep of existing facilities and programs, will be the primary costs associated with wildlife observation, photography, environmental education and interpretation offered on the Refuge. Law enforcement support will continue to be necessary to ensure compliance with Refuge regulations. Additional funding will be required before the facilities and programs listed under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex EIS/CCP/LPP can be fully implemented. Refuge staff will pursue funding options through partnerships with other non-governmental organizations including the McFaddin and Texas Point Refuges Alliance, and pursue grants and matching funds to ensure that these strategies are implemented. Volunteer support will be critical to the Refuge's ability to fully implement the strategies listed under Refuge Management Alternative D.

Anticipated Impacts of Use(s):

The potential impacts of the Texas Point NWR wildlife observation, photography, environmental education and interpretation programs on the USFWS' ability to achieve Refuge purposes and the National Wildlife Refuge System mission are evaluated here.

Threatened and Endangered Species: Federally-listed Threatened and species (T&E species) known to use the Refuge include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). No impacts to Federally-listed Threatened and Endangered species populations are expected to occur due to wildlife observation, photography, environmental education or interpretation. Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast, and are regularly reported on Texas Point NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Some disturbance to basking alligators may occur from visitor use.

Habitats: The greatest potential for impacts to vegetation resources and habitats likely comes from motorized boating activities. Wetland vegetation, especially submerged aquatic vegetation, can be impacted by motorboat activity. For example, propeller scarring has been shown to detrimentally impact seagrass beds in the Laguna Madre in South Texas (Pulich *et al.* 1997, Dunton *et al.* 1998) and in Florida (Madley *et al.* 2004). Propeller scarring leaving permanent channels in shallow pond and waterway bottoms on the Refuge has also raised concerns about the potential for increased saltwater intrusion, with concurrent negative impacts on emergent and submergent aquatic vegetation. Boating, either motorized or non-motorized, also has the potential to introduce or redistribute non-native invasive species.

Migratory Birds and other Biological Resources: Primary means of access to areas on the Refuge used for wildlife observation and photography are by foot on trails and levee, and by motorized boats, airboats, and non-motorized boats in Texas Bayou and associated tributaries. Walking is the primary means of access for environmental education and interpretation programs on Texas Point NWR. Impacts associated with wildlife observation, photography, environmental education and interpretation activities

vary based on mode of access. Walking, bicycling, and motorized and non-motorized boating all have the potential to disturb wildlife and influence distribution and habitat use.

Disturbance of wildlife by visitors is likely to be greatest in concentrated areas of use, including along trails, boardwalks, observation platforms and along roads (Klein 1993). While some species appear to acclimate to vehicular traffic, and even presence of visitors on trails, boardwalks, and observation platforms, other species are less tolerant of disturbance. Overall it is likely that species composition and abundance is decreased in areas supporting these recreational uses.

Disturbance impacts to birds from visitation are often magnified during the breeding season. Color of clothing worn can attract or repel different passerine species based on breeding plumages of those species (Gutzwiller and Marcum 1997). Primary song occurrence and consistency of certain passerines can be impacted by a single visitor (Gutzwiller *et al.* 1994). Predation on songbird, raptor, colonial nesting species and waterfowl nests tends to increase near more frequently visited areas (Dwernychuk and Boag 1972, Buckley and Buckley 1978, Lenington 1979, Boyle and Samson 1985, Miller *et al.* 1998,). Glinski (1976) suggests that attracting wildlife using taped vocalizations may increase energy expenditures of wildlife, disrupt territory establishment, and increase susceptibility to predation.

In general, activities that occur outside of vehicles (along walking trails, etc), tend to increase disturbance potential for most wildlife species (Burger 1981, Klein 1993, Gabrielsen and Smith 1995). In wetland habitats, disturbance from out of vehicle approaches can reduce the time spent foraging or even cause avoidance of areas disturbed (Klein 1993). Similarly, walking tends to displace birds and can cause localized declines in species richness and abundance (Riffell *et al.* 1996).

Walking with pets can cause additional disturbances to wildlife. Pets are known to both chase and kill wildlife (George 1974, Lowry and McArthur 1978). The greatest increase in heart rates of bighorn sheep occurred when approached by humans with a dog (MacArthur *et al.* 1982). Prairie chickens showed a stronger fear response to domestic dogs than to native predators such as foxes (Hamerstrom *et al.* 1965).

Motorized boating has been shown to affect the abundance, distribution and habitat use of waterfowl and other birds (Dahlgren and Korschgen 1992, Knight and Cole 1995). Non-motorized boats, vehicles on roads, and walking also have potential to disturb birds and influence distribution and habitat use (Burger 1981, Knight 1984, Klein 1993). Compared to motor and airboats, canoe, kayak and rowboat travel appears to have the least disturbance effects on most wildlife species (Jahn and Hunt 1964). Non-motorized boats can still cause significant disturbance effects based on the ability to penetrate into shallower areas (Speight 1973). Vos *et al.* (1985) reported that slow-moving boats caused disturbance to nesting great blue herons when maneuvering directly below the heronries, where most other boats could not access due to shallow water. Kaiser and Fritzell (1984) reported that green-backed heron activity declined on three of four survey routes when canoes and boat use increased on the main river channel of the Ozark National Scenic Riverway.

Texas Point NWR has a special regulation allowing the use of airboats powered by 10 horsepower or less with direct drive, with a propeller length of 48 inches or less. Airboat engines may not exceed 2 cylinders and 484 cc. These types of airboats are limited to traveling in open water where all other motorized boating occurs. They are not capable of cross-country travel, and therefore should not cause damage to wetland vegetation or disturbance to wildlife in areas outside of boating activity.

A variety of regulations govern means of access to public use areas, including boat motor and horsepower restrictions, and prohibition of all-terrain vehicle use. While these regulations are in place primarily to protect habitats and public safety, they also reduce overall disturbance impacts to waterfowl and other migratory birds.

Disturbance impacts caused by wildlife photographers tend to be greater than other wildlife observation techniques (Klein 1993, Morton 1995, Dobb 1998). Photographers are much more likely to leave their vehicles and approach wildlife on foot (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to

their presence (Dobb 1998) and the tendency of casual photographers with low power lenses to get much closer to their subject than other activities would require (Morton 1995).

Litter improperly discarded by visitors can entangle wildlife or be ingested, potentially resulting in injury or death (Gregory 1991). Efforts to educate the public about such issues are incorporated into outreach efforts and educational programs.

Other Wildlife-dependent Recreational Uses: A major goal of Texas Point NWR is to provide opportunities for wildlife-dependent recreation. Few conflicts among users of the Refuge have been documented in relation to recreational activities. Natural spatial and temporal separations between recreational users of the Refuge help minimize conflicts. Most visits for wildlife observation and photography, environmental education and interpretation occur in the spring, outside of the waterfowl hunting season. Visits for wildlife observation and photography, environmental education and interpretation occur primarily on established trails in small refuge woodlands, and along the north-south levee which bisects the Refuge. There is potential for some conflicts between motorized and non-motorized boaters using waterways on portions of the Refuge open for fishing and wildlife observation and photography. Overall, visitation by boat in support of wildlife observation and photography is low and no known conflicts between uses have occurred.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Stipulations designed to ensure compatibility for wildlife observation, photography, environmental education and interpretive programs outlined in the description of use section should minimize impacts to a point where these activities would be compatible with the purposes established for Texas Point NWR.

Designated areas of the Refuge will be open for wildlife observation, photography, environmental education and interpretation from one hour before sunrise to one hour after sunset daily. By concentrating disturbances to these designated areas, large areas of undisturbed habitat are available for wildlife.

Visitors may walk the designated trails and levee to view and observe wildlife. Bicycles are permitted on the levee only. Opportunities for wildlife observation and photography are also available from boat in Texas Bayou and associated tributaries. Outboard motor boats, airboats, and non-motorized boats may be used to access these waterways in Texas Point NWR. Airboats may not exceed 10 hp with direct drive with a propeller length of 48 inches or less, and engines may not exceed 2 cylinders and 484 cc. On inland waters of the Refuge open to motorized boats, the operation of motorized boats is restricted to lakes, ponds, ditches, and other waterways. Motorized boats are prohibited on or through emergent wetland vegetation. In addition, the use of boats powered by air-cooled or radiator-cooled engines is restricted to those powered by a single engine of 25 horsepower or less and utilizing a propeller 9 inches (22.5 cm) in diameter or less. By year 2011, all motorized boats on inland waters of the Refuge will be restricted to 25 hp or less. Boat motor horsepower restrictions would not apply on Texas Bayou. This grace period of 5 years is aimed to provide those visitors currently using boats with a horsepower greater

than 25 ample time to prepare for this change in regulation. In areas where propellers are damaging submergent vegetation and creating permanent channels in shallow water, no prop zones may also be initiated. Regular monitoring will be required to adequately determine where these zones would best be located. Marsh buggies, all-terrain vehicles and personal watercraft are prohibited on the Refuge.

Shallow water boats can launch at a private dock at Texas Bayou, or from the nearby Dick Dowling State Park for a small fee.

Recordings to attract wildlife are prohibited. The collection of plants or animals, or feeding or disturbing wildlife, is prohibited. Pets must be leashed at all times.

Continued law enforcement patrols will be necessary to ensure compliance with these and State and Federal regulations. Public use trends and associated impacts from human activity will continue to be monitored. If significant increases in use are found, and/or if impacts to resources are determined significant, the program will be reevaluated and modified as necessary to ensure compatibility.

Justification:

These programs are determined to be compatible with the establishment purposes of the Refuge and the mission of the National Wildlife Refuge System. Wildlife observation, photography, environmental education and interpretation are wildlife-dependent, priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. The USFWS strives to provide priority public uses when compatible with the purpose of the Refuge and the mission of the System. Facilities and activities related to wildlife observation, photography, environmental education and interpretation occur in designated areas of the Refuge, leaving large areas of undisturbed habitat available for wildlife. The stipulations outlined above are specifically designed to and should minimize potential impacts of these activities. The Refuge will continue to monitor uses and adjust programs as necessary to protect Refuge resources. The educational benefits gained from these activities are expected to outweigh their associated impacts. Providing opportunities for wildlife observation, photography, environmental education and interpretation has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving habitat, thereby further contributing to the overall mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Audie J. Lorange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Sp... 5-4-07
(Signature and Date)

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COMPATIBILITY DETERMINATION: TEXAS POINT NWR – CONTROLLED LIVESTOCK GRAZING

Use: Controlled Livestock Grazing

Refuge Name: Texas Point National Wildlife Refuge

County: Jefferson County, Texas

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Emergency Wetlands Resources Act, Refuge Recreation Act, Fish and Wildlife Act of 1956

Refuge Purpose (s):

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission:

"The mission of the National Wildlife 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 Administration Act of 1966, as amended) [16U.S.C. 668dd-668ee].

Description of Use:

Texas Point National Wildlife Refuge (NWR) proposes to continue the controlled grazing program in designated areas that are compatible with Refuge purposes. Permittee cattle operations are an economic use of Refuge lands and provide a critical tool for Refuge management. This Compatibility Determination considers continuation of the controlled grazing program on the Refuge, and includes consideration of modifications to the program proposed by the USFWS under Refuge Management Alternative D (Preferred Alternative) of the Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2007).

Cattle grazing is an inexpensive, dependable, and effective tool used to accomplish Refuge goals, specifically for management of migratory birds including wintering and resident waterfowl, shorebirds and wading birds. Grazing is used to: 1) open up dense vegetation; 2) depress perennial plants; 3) encourage growth of annual grasses and sedges; and 4) reduce tall, rank grass types and encourage creeping grass species. This program is implemented to encourage a mosaic of heavily, moderately, and ungrazed areas to provide habitats in multiple successional stages on the Refuge.

The grazing program on Texas Point NWR is a cow-calf operation with some bulls introduced for breeding. The cow bloodline is a mixed breed of Zebu ancestry, with Brahma or Charolais bulls used for breeding. The majority of the habitat on Texas Point NWR is coastal marsh that is managed with cool-season grazing. Using a graze-rest strategy, permittees typically graze October through April. An average of 761 (range 0 – 1,140) animal unit months (AUMs) occurred annually on Texas Point NWR between FY 1999-2005. Grazing strategies include variations in stocking rates, timing (cool vs. warm season) and duration. Stocking rates and rotations are determined annually according to management objectives for the various grazing units and the quantity and condition of forage in those units, and are often influenced by the availability of freshwater.

Grazing does not take place uniformly across units, particularly in coastal marshes. Cattle tend to concentrate grazing pressure adjacent to upland areas with decreased grazing pressure with increasing distance from high ground. Acres grazed and grazing pressure varies from year to year. In a typical year, cattle graze approximately 2,500 acres on Texas Point NWR.

Prescribed burning is an integral part of using cattle to meet management objectives. Fire can be used to create favorable foraging conditions for cattle and focus grazing pressure. Excluding high priority uplands, such as salty prairie sites, from burning can reduce grazing pressure where it is less desirable while focusing it on adjacent wetlands.

Availability of Resources:

Adequate refuge personnel and base operational funds are available to manage the grazing program at existing and projected levels. Costs associated with this activity are primarily staff time. Some additional expenses are incurred through site preparation required to protect grazing infrastructure from fire operations. The cost of new or replaced infrastructure is shared between the permittee and the USFWS.

Anticipated Impacts of Use:

Controlled grazing can be an effective and inexpensive tool in wetland and grassland management providing habitat components that benefit waterfowl and other wildlife species. The relation of cattle grazing to wildlife varies considerably, depending on stocking rate, seasonality, plant community, and wildlife concerned (Chabreck 1968). Research indicates that dual use of grasslands by wildlife and livestock is often compatible when livestock grazing is carefully managed and wildlife needs are considered (Holechek 1982).

Threatened and Endangered Species: Federally-listed Threatened and Endangered species (T&E species) known to use Refuge habitats include bald eagle (*Haliaeetus leucocephalus*, Threatened), brown pelican (*Pelecanus occidentalis*, Endangered), piping plover (*Charadrius melodus*, Threatened), and American alligator (*Alligator mississippiensis*, Threatened). Bald Eagles are rarely observed on the Refuge. They typically feed on wounded or sick birds, and in the past were associated with large concentrations of wintering waterfowl that occurred on the Refuge. Brown Pelicans are commonly observed flying over the Refuge and resting along the shoreline of the Gulf of Mexico. Piping plovers winter primarily along the Texas Gulf Coast and are regularly reported on Texas Point NWR beaches. They utilize beaches, sand flats, mud flats, and dunes along the coast, offshore islands, and spoil islands. American alligators are Federally-listed as Threatened due to their similarity in appearance to the American crocodile (*Crocodylus acutus*), an Endangered species. Alligator populations on and around the Refuge are currently at relatively high levels. The grazing program should pose no threat to alligators on the Refuge. Overall, no impacts to Federally-listed Threatened and Endangered species are expected to occur as a result of the grazing program on the Refuge.

Habitats: Grazing (integrated with fire and water management) in wetland habitats on the Refuge promotes the germination, growth and reproduction of several "early successional" target plant communities which are especially beneficial to migratory birds as food sources (Gosselink *et al.*, 1979; Allen 1956). Target plant communities in intermediate and brackish marsh habitats on the Refuge include olney bulrush (*Scirpus americanus*), saltmarsh bulrush (*Scirpus robustus*), seashore paspalum (*Paspalum vaginatum*), seashore saltgrass (*Distichlis spicata*) and annual grasses including millets (*Echinochloa* spp.) and sprangletops (*Leptochloa* spp.), several sedges, and several annual forbs such as purple ammenia (*Ammania coccinea*). Moderate grazing following burns in marshes also prolongs the availability of new grass shoots, a valuable food for snow geese (Gosselink *et al.* 1979). Grazing also helps provide optimal physical structure of vegetation for waterfowl utilization in emergent marshes and other vegetated wetlands by creating openings in otherwise dense stands of vegetation and maintaining plant communities such as seashore paspalum which grow low to the ground. These conditions also provide excellent habitat for many invertebrate species, another important food source for waterfowl and other migratory birds. Proper grazing of salty prairie seems to produce favorable nesting structure for Mottled Ducks.

Savory and Butterfield (1998) make an important distinction between what they call brittle and non-brittle landscapes. Brittleness is a term used to describe ecosystem resilience to disturbance and forms a continuum from brittle to non-brittle. Non-brittle environments have relatively high, evenly distributed rainfall, rapid recycling of nutrients through decaying plant and animal material and active microorganisms. Brittle environments tend to dry out quickly, have low nutrient recycling and low microorganism activity. Coastal marshes of the upper Texas coast are very much toward the non-brittle end of the spectrum. These marshes experience high annual rainfall distributed throughout the year, a long growing season, very fast nutrient recycling, and vegetation recoveries quickly following disturbances. These conditions require protracted disturbance events, such as grazing, to maintain early successional conditions for any length of time.

Studies conducted on Sabine National Wildlife Refuge in Cameron Parish, Louisiana (Valentine 1961) determined that increased grazing can change tall climax marshhay cordgrass stands to more diverse community such as seashore paspalum, *Setaria*, and longtom (*Paspalum lividum*), that are more beneficial to certain types of wildlife. Depending on site conditions (elevation, soil, and hydrology) annual grasses and forbs (including millets, fall Panicum (*Panicum dichotomiflorum*), sprangletop, and *Setaria*) can be produced through proper grazing.

Pate (2001) found that grazed marshes remained in a sub-climax state, while habitat within grazing exclosures reverted to marshhay cordgrass. At the onset of the study *Spartina* spp. made up 20% of the plant community, while seashore paspalum comprised 80%. By the end of the study, communities within grazing exclosures changed to 65% *Spartina* spp. and 25% seashore paspalum. In contrast, the grazed area maintained high cover of seashore paspalum throughout the study. Seashore paspalum provides habitat for many species of waterfowl, wading birds and shorebirds, depending on hydrology, while marshhay cordgrass largely precludes these species.

The detrimental affects of grazing in coastal marsh environments includes the risk of overgrazing if units are not closely monitored, bank erosion, excessive trampling of vegetation, compaction of soils reducing percolation rates, and the deposition of nutrients in the form of manure in areas where livestock concentrate (USFWS 1994). Warm-season grazing of wetland areas can reduce seed production of annual grasses (Chabreck 1968).

Migratory Birds and Other Biological Resources: Proper grazing can promote habitat for snow geese, puddle ducks, Wilson's snipe and rails (Chabreck 1968). Chabreck notes that anything more than light grazing would be detrimental to muskrats. Yeargan (2001) determined that the number of shorebirds, herons and egrets was greater in grazed than ungrazed marshes on Galveston Island, Texas, while the number of gulls, terns, sparrows, rails and other species was not different. Mizell (1998) studied wintering yellow rails on Anahuac NWR and suggested that cattle grazing may increase availability of yellow rail habitat.

Management tools used to set back succession (grazing, fire, mechanical disturbance, and herbicides) benefit most wetland-dependent species. The extent to which these tools are applied can be detrimental to some species, while benefiting others. An example of this would be an intensive grazing regime that reduces emergent wetland vegetation, benefiting waterfowl, shorebirds and wadingbirds, but detrimental to species desiring ranker conditions, such as sedge wrens and seaside sparrows. In the practical application of a tool like grazing, the available herd is focused in certain areas to achieve the moderate grazing regime desired, leaving large areas lightly grazed or ungrazed to the benefit of the species desiring the cover of emergent vegetation. Neither intensive grazing nor the lack of grazing is desired over the whole Refuge. Rather, a mosaic of heavily, moderately, and ungrazed wetlands is the target of the grazing management program.

Wildlife-Dependent Recreational Uses: A major goal of Texas Point NWR is to provide high quality opportunities for wildlife-dependent recreation. The refuge supports all six of the Refuge System's priority wildlife-dependent uses: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Conflicts can occur between these uses and the controlled livestock grazing program, but conflicts and potential safety issues are minimized through management which includes regular and

recurring maintenance of infrastructure (fences, gates, and cattleguards). In addition, grazing is excluded from refuge units supporting trails, boardwalks, observation platforms and other infrastructure used for wildlife observation and photography, environmental education and interpretation. Grazing units and refuge hunt areas do overlap without negative impacts to either program.

Public Review and Comment:

This Compatibility Determination was published with the Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP, and was available for public review and comment concurrent with the Draft EIS/CCP/LPP from October 17, 2006 through January 16, 2007. A Notice of Availability for the Draft EIS/CCP/LPP was published in the Federal Register on October 17, 2006. Formal public hearings on the Draft EIS/CCP/LPP were held in Port Arthur, Texas and Hankamer, Texas on November 28, 2006 and November 30, 2006, respectively.

Determination:

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The controlled grazing program provides the Refuge with a management tool to improve habitat quality for migratory birds. The grazing program must assist the Refuge in meeting management objectives.

The grazing program is governed through the issuance of Special Use Permits to permittees. Stipulations necessary to ensure compatibility with Refuge establishment purposes and the mission of the NWRS are included as the Special Conditions of the Special Use Permit. Permittees must adhere to all conditions set forth in Special Use Permit, including the following:

- Permittees will graze cattle in only designated locations of the Refuge. Stocking rates and pasture rotations will be specified by the Refuge Manager.
- The Refuge Manager must be notified in advance of any introduction or removal of cattle.
- Permittees must annually provide a written record of cattle numbers and movements on an off the Refuge.
- Fences, gates, and cattleguards must be maintained by the Permittee with materials provided by the Refuge.
- Permittees must comply with all state and federal livestock health laws.

Refuge staff and grazing permittees must continually monitor habitat conditions and communicate throughout the adaptive management cycle. Factors such as stocking rate, duration, and seasonality must be adjusted as necessary to meet Refuge objectives under changing environmental conditions. To be successful, all participants must understand successional relationships of plant communities and effects of decisions under changing environmental conditions to keep the program aligned with Refuge goals and management objectives. Both short- and long-term monitoring of grazing impacts on Refuge habitats is needed to guide this adaptive management approach.

Justification:

Prescribed cattle grazing is an inexpensive, dependable, and effective tool for managing habitats on Texas Point National Wildlife Refuge. Applications of other disturbance tools, such as fire, are strongly influenced by weather conditions and numerous regulatory restrictions and are less likely to be available when needed. Grazing is a management tool that, in most instances, can be more dependably implemented to assist in creating sub-climax conditions. High, well-distributed rainfall, rapid decomposition and recycling of nutrients, and long growing seasons makes coastal marshes a less brittle ecosystem (Savory and Butterfield 1998). When properly managed, there are few detrimental effects of grazing coastal marshes, most being aesthetic in nature. When conducted in accordance with the

stipulations listed herein, managed cattle grazing is compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Signature: Refuge Complex Manager: Andie J. Horange 1-19-07
(Signature and Date)

Concurrence: Regional Refuge Chief: Chris Spence 5-4-07
(Signature and Date)

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APPENDIX F: WILDERNESS REVIEW

Introduction

A wilderness review is the process used by the U.S. Fish & Wildlife Service (USFWS) to identify and recommend for Congressional designation, National Wildlife Refuge System (System) lands and waters that merit inclusion in the National Wilderness Preservation System (NWPS). The USFWS is required to conduct a wilderness review for each refuge as part of the Comprehensive Conservation Plan (CCP) process.

For a refuge to be considered for wilderness designation, all or part of the refuge must:

- Be affected primarily by the forces of nature, with the human imprint substantially unnoticeable;
- Have outstanding opportunities for solitude or primitive and unconfined type of recreation;
- Have at least 5,000 contiguous acres or be sufficient in size to make practical its preservation and use in an unimpaired condition, or be capable of restoration to wilderness character through appropriate management, at the time of review; and
- Be a roadless island.

There are three phases to the wilderness review process: (1) inventory, (2) study; and (3) recommendation. Lands and waters that meet the minimum criteria for wilderness are identified in the inventory phase. These areas are called Wilderness Study Areas (SA).

In the study phase, a range of management alternatives are evaluated to determine if a SA is suitable for wilderness designation or management under an alternate set of goals and objectives that do not involve wilderness designation.

The recommendation phase consists of forwarding or reporting the suitable recommendations, if any, from the Director through the Secretary and the President to Congress in a wilderness study report. The wilderness study report is prepared after the record of decision for the final CCP has been signed. Areas recommended for designation are managed to maintain wilderness character in accordance with management goals, objectives, and strategies outlined in the final CCP until Congress makes a decision or the CCP is amended to modify or remove the wilderness proposal.

Wilderness Act

Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) -- Public Law 88-577, approved September 3, 1964, directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System, with final decisions made by Congress. The Secretary of Agriculture was directed to study and recommend suitable areas in the National Forest System (USFWS 2004a, b; BLM, 2001; Wilderness.net, 2004).

The Act provides criteria for determining suitability and establishes restrictions on activities that can be undertaken on a designated area. It authorizes the acceptance of gifts, bequests and contributions in furtherance of the purposes of the Act and requires an annual report at the opening of each session of Congress on the status of the wilderness system.

Under authority of this Act over 25 million acres of land and water in the National Wildlife Refuge System were reviewed. Some 7 million acres in 92 units were found suitable for designation. From these recommendations, as of December 1998, over 6,832,800 acres in 65 units have been established as part of the National Wilderness Preservation System by special Acts of Congress. (USFWS 2004a, Wilderness.net, 2004)

Wilderness Characteristics

Wilderness characteristics are discussed in Section 2 (c) of the Wilderness Act of 1964 (BLM 2001), which Congress incorporated in FLPMA, Sec. 603 (43 USC 1782). The Wilderness Act states:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Analysis of Wilderness Characteristics

Each inventory unit must be evaluated for:

Size - Determine if the inventory unit, including acres of contiguous lands having wilderness character "has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition" (USFWS 2004a, b; BLM 2001).

Roadless - Inventory units must be roadless. Roads were clearly identified and their impact on the naturalness of the area evaluated. If an access route met the road definition, its use and possible long-term need was documented. In order to ensure a consistent identification of "roads" as opposed to an unmaintained vehicle way, the following definition was used:

"The word 'roadless' refers to the absence of roads which have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A 'way' maintained solely by the passage of vehicles does not constitute a road."

This language is from the House Committee Report 94-1163, page 17, dated May 15, 1976, which forms part of the legislative history of the Federal Land Policy and Management Act (FLPMA) (BLM 2001). The 1978 BLM Wilderness Inventory Handbook further defined certain words and phrases in the road definition and these were also used in this inventory:

"Improved and maintained" - Actions taken physically by people to keep the road open to vehicle traffic.

"Improved" does not necessarily mean formal construction. *"Maintained"* does not necessarily mean annual maintenance.

"Mechanical means" - Use of hand or power machinery or tools.

"Relatively regular and continuous use"—Vehicular use that has occurred and will continue to occur on a relatively regular basis. Examples include access roads for equipment to maintain a stock water tank or other established water sources, access roads to maintained recreation sites or facilities, or access roads to mining claims". (BLM 20001, USFWS 2004a)

Road areas within the Refuge Complex include levees, canals, and ditches due to the required access necessary to maintain all water control structures located throughout the Refuge Complex. Additionally,

the road analysis identified public roads, USFWS management roads and primitive roads located on the beach ridge traveled by the public within and adjacent to McFaddin NWR.

Naturalness - Determine if the area ". . . generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." Findings regarding naturalness should be based on the appearance of the area as seen from the ground (USFWS 2004a, b; BLM 2001).

Solitude or a Primitive and Unconfined Type of Recreation - Determine if the area ". . . has outstanding opportunities for solitude or a primitive and unconfined type of recreation" The word "or" in this sentence means that an area has to possess only one or the other. It does not have to possess outstanding opportunities for both elements, and does not need to have outstanding opportunities on every acre. However, there must be outstanding opportunities somewhere in the unit. When review units are contiguous to wilderness study areas or other agency lands with identified wilderness values, they were considered an extension of the wilderness study area; no additional evaluation of outstanding opportunities was required (BLM 2001, USFWS 2004a, b).

Supplemental Values - Determine if the inventory unit contains ". . . ecological, geological, or other features of scientific, educational, scenic, or historical value." The Wilderness Act states a wilderness "may also contain" these values. Supplemental values are not required for wilderness, but their presence is documented where they exist. A finding that an inventory unit lacks any or all of the supplemental values did not affect the determination of the existence of wilderness character (USFWS 2004a, b; BLM 2001).

The Refuge Complex Description

The Refuge Complex project area (105,668 acres) includes the Moody, Anahuac, McFaddin, and Texas Point National Wildlife Refuges.

Moody NWR is located in along East Galveston Bay in south-central Chambers County and contains approximately 3,516 acres. The USFWS holds a perpetual non-development conservation easement on Moody NWR, which is otherwise entirely privately owned.

Anahuac NWR is located on the north shore of East Galveston Bay. Almost all of the Refuge lies within Chambers County, with a small portion lying south of the GIWW in Galveston County. The Refuge is bounded by Robinson Bayou on the west, State Highway 124 on the east, several private farms and ranches and F.M. Road 1985 on the north, and East Bay and the GIWW on the south. Anahuac NWR consists of approximately 34,339 acres which is owned primarily in fee by the United States.

McFaddin NWR is located along the Gulf Coast between the towns of High Island, to the west, and Sabine Pass, to the east, and contains about 15 miles of Gulf shoreline. Almost all of the refuge lies in Jefferson County with very small areas in Chambers and Galveston Counties. The GIWW dissects McFaddin NWR and divides once contiguous watersheds into two distinct units. The approximately 58,861 acres within McFaddin NWR are owned primarily in fee except for a nearly 6,475 acre conservation easement (White Easement) on the Gulf side of the GIWW.

Texas Point NWR is located on the southeastern most tip of Texas, bounded by the Sabine Pass waterway on the east and the Gulf on the south, with about 6 miles of Gulf shoreline. The approximately 8,952 acres within Texas Point NWR are all owned in fee.

Wilderness Inventory and Study

The wilderness inventory is a broad look at the planning area to identify SAs. These are roadless areas that meet the minimum criteria for wilderness identified in Section 2 (c) of the Wilderness Act. A SA must meet the size criteria, appear natural, and provide outstanding opportunities for solitude or primitive recreation (USFWS 2004a, b; BLM 2001).

Size Criteria

Roadless areas meet the size criteria if any one of the following standards applied.

- An area with over 5,000 contiguous acres. State and private lands are not included in making this acreage determination.
- An area of less than 5,000 contiguous Federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous Federal acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another Federal wilderness managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

Evaluation of Size Criteria

Moody NWR: does not meet the size criteria because it consists entirely of private lands. Since Moody NWR does not meet the minimum necessary standard of being “an area of undeveloped federal land [emphasis added]” in the Wilderness Act, it does not qualify for recommendation as a wilderness area.

Anahuac NWR: does meet the minimum size requirement and will be further evaluated.

McFaddin NWR: does meet the minimum size requirement, except for the White Easement which is private lands.

Texas Point NWR: does meet the minimum size requirement and will be further evaluated.

Conclusion: Moody NWR does not meet the size criteria and will not be considered further. Anahuac NWR, Texas Point NWR, and McFaddin NWR (except for the White Easement) meet the size criteria and will be considered further.

Roadless Criteria

Identification of Roadless Areas

Identification of roadless areas required gathering land status maps, land use and road inventory data, and aerial photographs of existing Refuge Complex mainland tracts and islands. The definition of “roadless” was discussed earlier in this document in the Introduction. Lands currently owned by the USFWS in fee title were evaluated. These lands are included within the project area boundaries of Anahuac NWR, McFaddin NWR, Texas Point NWR.

In summary there are 10 bridges and 420.6 miles of roads, levees, ditches and canals utilized throughout the proposed project area providing access for various needs. This access primarily is for water control and access to refuge lands for management activities, associated oil and gas exploration, and public use.

In addition, there are a total of 180 water control structures located throughout the project area that are utilized by agencies, organizations and water districts for water management purposes. Access to the water control structures is needed daily in some cases. Therefore, there are no roadless areas that provide for the “naturalness” as defined in the House Committee Report 94-1163, page 17, dated May 15, 1976, which forms part of the legislative history of the Federal Land Policy and Management Act (FLPMA) (BLM 2001).

Evaluation of Roadless Criteria

The three remaining possible SA's are evaluated to determine if they meet the "roadless" wilderness characteristic.

Anahuac NWR: Access via roads, levees, canals and ditches to the refuge totals 321 miles. Specifically, the 321 miles of access includes 253.8 miles of levee, canal or ditch access for maintenance of the levees, canals or ditches. This also provides access to the 171 water control structures located within the refuge. There are seven bridges utilized by agencies, organizations and the public to access the refuge for numerous needs. Roads used by the refuge staff for refuge management purposes totals 30.4 miles with public access roads totaling 36.8 miles (USFWS 2005a)

McFaddin NWR: Access via roads, levees, canals and ditches to access the refuge totals 97.6 miles which includes the GIWW levees. Specifically, the 97.6 miles of access includes 63.5 miles of levee, canal or ditch access for maintenance of the levees, canals or ditches. This also provides access to the nine water control structures located within the refuge. There are three bridges utilized by agencies, organizations and the public to access the refuge for numerous needs (USFWS 2005a). Roads used by the refuge staff for refuge management purposes totals 7.6 miles with public access roads totaling 26.5 miles which includes 15 miles of 4-WD primitive road located on the beach ridge which is traveled by the public and receives minimal maintenance (USFWS 2005a).

Texas Point NWR: Access via levees to the refuge totals two miles. This also provides access to the five water control structures located within the refuge. There are no canals, ditches, USFWS management roads or public roads located on this refuge (USFWS 2005a).

In summary there are 10 bridges and 420.6 miles of roads, levees, ditches and canals utilized throughout the Refuge Complex providing access for various needs. This access primarily is for water control and access to refuge lands for management activities, associated oil and gas exploration/development, and public use. In addition, there are a total of 180 water control structures located throughout the Refuge Complex that are utilized by agencies, organizations and water districts for water management purposes. Access to the water control structures is needed daily in some cases.

Conclusion: None of the three areas meet the criteria for being "roadless".

Naturalness Criteria

In addition to being roadless, a SA must meet the naturalness criteria. Section 2(c) defines wilderness as an area that "... generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." The area must appear natural to the average visitor rather than "pristine." The presence of historic landscape conditions is not required. An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole (BLM 2001, USFWS 2004a, b).

Significant human-caused hazards, such as the presence oil & gas exploration/development activities and the physical impacts of refuge management facilities and activities are also considered in evaluation of the naturalness criteria. An area may not be considered unnatural in appearance solely on the basis of the "sights and sounds" of human impacts and activities outside the boundary of the unit. The cumulative effects of these factors in conjunction with size, extent of Federal holdings, and physiographic and vegetative characteristics were considered in the evaluation of naturalness for each area (USFWS 2004a, b).

In the wilderness inventory, specific human impacts were identified that significantly affected the overall apparent naturalness of the lands located within the three evaluated Refuges and are considered in combination with size and physical characteristics. The following factors were primary considerations in evaluating naturalness:

- presence of 180 water control structures (WCS) and 420.6 miles of associated levees, canals, ditches, USFWS management roads, and public access roads (USFWS 2005a);
- presence of oils & gas pads, platforms, access roads, pipelines, and future expansion of oil and gas fields;
- recent 3-D seismic exploration which requires sounding in a grid pattern of 220 feet by 1760 feet for an entire area. Currently a 3-D seismic exploration survey is occurring at McFaddin NWR which is proposed to cover 233 square miles that encompasses on and off refuge properties (USFWS 2005b);
- further development of existing oil and gas fields with technological advancements and additional 3-D seismic exploration surveys;
- water management activities;
- grazing and agricultural programs which utilize various portions of the refuges at various time of the year limiting the naturalness of the area;
- prescribe burning for habitat improvement and invasive species control limits the naturalness of the area;
- substantial private inholdings with developments such as private residences or incompatible activities;
- presence of established recreational facilities; and/or
- areas unsafe for public use or public access.

Evaluation of Naturalness Criteria

Mineral Resources and Related Exploration and Development

Oil and gas exploration and development has occurred within the project area for over 100 years. The famous “Spindletop Dome” discovery well which came in as a “gusher” on January 10, 1901, is located just to the north of McFaddin NWR in Jefferson County. This discovery well and the subsequent oil boom ushered in the modern age of petroleum. The gusher at Spindletop was responsible for creating several companies that were to become giants in the oil industry including Gulf Oil, Amoco, and Humble Oil Company (later to become part of Exxon).

The USFWS acquired the lands within the Refuge Complex subject to outstanding third-party mineral interests and the reservation by the Sellers of their mineral interests. Also, the USFWS acquired these lands subject to many pipeline easements and has subsequently issued a number of pipeline rights-of-way. Since the USFWS does not own the mineral interest under the lands within the Refuge Complex, the USFWS must provide reasonable and necessary access to mineral owners to explore and develop their mineral interests under provisions provided under 50 CFR 29.32.

Anahuac NWR: Oil and gas exploration and development has also occurred throughout the Anahuac NWR, and infrastructure associated with formerly producing wells remains. The Roberts-Mueller oil and gas field was developed in the 1950’s and 1960’s, and is the site of the most-concentrated oil and gas exploration and development on the Refuge. Houston Oil Producing Enterprises, Inc. and Alegre Energy, Inc., are the current leaseholders/operators of the Roberts-Mueller field which includes a tank battery facility. Kerr-McGee Oil and Gas Onshore, LLC currently holds exploration and development leases and drilled a producing well on the northern portion of the East Unit on the Refuge in 2000/2001. Product from this well is transported via a gathering line to an off-refuge separator/tank battery facility located north of F.M. Road 1985. Kerr-McGee has now proposed drilling additional wells on this lease.

There are several pipeline easements within Anahuac NWR. The Centena Pipeline Co. holds an easement for a 12” natural gas pipeline which comes onshore from Galveston Bay near Robinson Bayou and traverses the western portion of the Refuge. A Rutherford Oil Company 6” natural gas pipeline crosses the Mitigation Tract Unit of the Refuge and connects to the Centena pipeline. A small above-ground metering station is located near the intersection of these pipelines. Both the Rutherford pipeline and metering station are permitted under a Refuge Special Use Permit. The Winnie Pipeline Co. holds an easement for a natural gas pipeline which traverses the Roberts-Mueller and East units in the

central portion of the Refuge. Kerr-McGee transports natural gas produced from the well on the Refuge via a connecting pipeline from their separator facility north of F.M. Road 1985 back south and west through the Refuge and connects to this pipeline.

McFaddin NWR: The Clam Lake field resulted in 85 wells being drilled. There are 29 to 50 wells that are currently active, although only a small number are producing at any one time. The oil field encompasses approximately 100 acres and includes separator facilities and tank batteries. PAPCO, Inc. is the current leaseholder/operator of the Clam Lake field. The oil and gas produced is transported by pipelines to temporary storage facilities located on the GIWW and then to distant refining facilities by barge. Oil and gas exploration and development has occurred throughout the refuge, and infrastructure (well pads, levees, roads, and gathering lines) from these activities remains. There are currently no producing wells outside of the Clam Lake field on the Refuge.

Easements for buried pipelines within McFaddin NWR are held by several companies. A 50-foot pipeline easement is held by United Gas Company for a 16 inch natural gas pipeline from the British Petroleum-Vastar facility north across the Refuge to private property located along the GIWW. A 50-foot easement is held by Scurlock Oil Company for a six inch crude oil pipeline paralleling the aboveground 16 inch line. Scurlock also holds a 50-foot easement for a four inch crude oil line located along the Gulf of Mexico shoreline. Shell Company/Exxon USA holds a 50-foot easement for a three inch natural gas pipeline from private property (Phelan property) along the GIWW to the Clam Lake oil field. The U.S. Department of Energy holds an easement for a buried 48" pipeline that carries brine from the Big Hill Strategic Petroleum Reserve to the Gulf of Mexico.

Texas Point NWR: No active oil and gas wells are present on Texas Point NWR at this time. Several inactive gas wells exist on the southeast end of the Refuge. A total of ten natural gas/crude oil pipelines cross Texas Point NWR. A waterline also exists along the western boundary of the Refuge.

Recent 3-D Seismic Surveys

Extensive seismic surveys have been conducted throughout the Refuge Complex, including several recent 3-D surveys conducted by several companies from 1996-2002. These recent seismic surveys have covered almost all of Anahuac and Texas Point NWRs, and the eastern portion of McFaddin NWR. Current 3-D seismic survey technologies consist of sample grids that are 220 feet by 1760 feet in area and extend seven miles in length. As many as 10 grid lines are run at the same time over a six day period (USFWS 2005b)

Refuge Complex Water Management

Water Rights

Anahuac NWR and McFaddin NWR have water rights associated with the Trinity River Basin and the western portion of the Neches-Trinity Coastal Basin (final determination October 30, 1985). Anahuac NWR is entitled to diversion and use of 21,000 acre feet of water per year from Oyster Bayou, tributary of East Bay, for wildlife purposes and irrigation of 825 acres of land. There are three diversion points on Oyster Bayou for a maximum combined rate of 88.89 cfs. With this water right (priority date of December 31, 1943), the USFWS can maintain reservoirs and impound 1,025 acre feet of water. Impounded water is used to maintain the following marsh units: Shoveler Pond, approximately 800 acre feet; Teal Slough, approximately 150 acre feet; and Marsh Pond, approximately 75 acre feet (Claim #2084, Certificate of Adjudication 07-4296, 1985).

Water rights associated with the East Unit of Anahuac NWR authorize diversion from two points on Onion Bayou, tributary of Oyster Bayou (priority date of September 21, 1970). This water right allows for the diversion and use of 5,932 acre feet of water annually from Onion Bayou to irrigate a maximum of 1,853.75 acres of land out of a 12,779.50 acre tract with a maximum rate of 26.67 cfs.

Most drainage ditches and agricultural water delivery systems are owned and maintained by county navigation and drainage districts, or similar agencies. Acquiring and receiving irrigation water may be possible from one of three water related authorities in the area, Chambers-Liberty Counties Navigation District, Devers Canal Association, and Lower Neches Valley Water Authority.

Lands within the study area that receive irrigation water either have water rights and pump from the creeks and bayous or purchase water from the above mentioned water purveyors. These irrigation and drainage districts provide water on a per acre or acre-foot basis which costs from approximately \$45 per acre in the Lower Neches River Authority to \$85 per acre in the Chambers-Liberty Counties Navigation District (USFWS, Engineering Assessment, 1998).

Water Management Regime

The historic hydrologic regimes of the coastal marshes in the project area have been greatly modified by the construction of the GIWW and numerous smaller canals and ditches, roads, levees and impoundments, and by the channelization of natural waterways. Saltwater intrusion, reduced or restricted freshwater inflows, and altered hydroperiods (wetting and drying cycles) resulted, which in turn impacted natural biological diversity and in some cases contributed to a net loss of emergent wetlands (Stone *et al.* 1978, Moulton *et al.* 1997). Land subsidence due to oil and gas extraction is the main cause of salt water intrusion into freshwater areas, which in turn requires extensive water management activities.

Given these extensive changes which in general have increased the potential for saltwater intrusion on the Refuge Complex, water management to control salinities and water levels within marsh habitats is implemented to help maintain the historic continuum of fresh, intermediate, brackish and saline marshes and the native plant, fish and animal communities that depend on these habitats. Water management, in coordination with the Refuge Complex controlled grazing and fire management programs, is also used to enhance marsh habitats for wintering and migrating waterfowl, shorebirds, wading birds, and other marsh and waterbirds.

In general, the typical water management regime for managed marshes on the Refuge Complex involves maintaining salinities within the range of the particular marsh type being targeted. Water level management regime across most of the Refuge Complex involves maintaining water levels which provide favorable conditions for dabbling ducks and geese during fall and winter.

Anahuac NWR: Approximately 12,000 acres of marsh habitats on Anahuac NWR are structurally managed by 253.8 miles of levees, canals and ditches that access 171 water control structures (USFWS 2005a). Large water control structures on Oyster Bayou, Onion Bayou, East Bay Bayou, Jackson Ditch, Oil Field Ditch and their associated levees and canal/ditch systems are the major water management infrastructure for these marsh units. Water management infrastructure on this refuge is extensive.

McFaddin NWR: The GIWW bisects the McFaddin NWR, and divides the Refuge into distinct units, the 5,914 acre North Unit and the 35,768 acre South Unit. The elevated banks of the GIWW are comprised of soils excavated during the canal's construction and are eroding rapidly due to barge traffic. Maintenance of these levees is a key management strategy to protect the interior marshes of the North and South units from saltwater intrusion. Approximately 18,000 acres of McFaddin NWR's marsh habitats are under structural marsh management that requires 63.5 miles of levees, canals and ditches which also includes the GIWW that access nine water control structures (USFWS 2005a).

The Willow Slough semi-impoundment, historically a reservoir supporting local rice production, is a large freshwater marsh now maintained via a 2,000-linear foot levee and low-level armored spillway located on the Refuge. The impoundment itself encompasses 1,500 acres of the Refuge (the North Unit) with the remaining 1,000 acres on private land.

Two major water control structures on Star Lake, one connecting it to the GIWW and the second at the outlet to Salt Bayou (5-mile Cut portion), prevent saltwater intrusion from the GIWW and provide

management capability to impound or release freshwater to help maintain the historically fresh and intermediate marshes in the central portion of the Refuge.

The 5000-acre Wild Cow Bayou Management Unit is located in the eastern portion of the Refuge. This levied marsh semi-impoundment is intensively managed as an intermediate marsh habitat. Two water control structures, one outletting to Salt Bayou and one to the GIWW, are used to maintain target water levels and salinities in this unit. The western two-thirds of the Refuge drains westward to the GIWW through an outlet ditch and via Mud Bayou. Water management in this portion of the Refuge is passive. Natural and man-made elevated features (several north-south levees and levees along the GIWW) control hydrology.

Refuge water control structures on the South Unit along Salt Bayou are part of a joint Texas Parks and Wildlife Department-USFWS water management plan, called the Salt Bayou Project (TPWD 1990). This management plan was developed for the entire 60,000 acres of federal and state wetlands located in southeastern Jefferson County, including the McFaddin NWR, Sea Rim State Park, and the J.D. Murphree Wildlife Management Area.

Refuge Complex Invasive Species Management

In general, mowing and prescribed burning are used on undisturbed native prairie and other grassland habitats to control upland exotic and invasive species. Prescribed burning and controlled grazing are the primary tool used in marsh habitats. Discing or roller chopping are used in rice fields and moist soil units to manage invasive species. Various control activities are also implemented by the local irrigation and drainage districts holding easements on Anahuac NWR. Target species are water hyacinth in canals and ditches, and Chinese tallow along canal and ditch banks.

Feral hogs are very prolific and are able to exploit wetland and upland habitats. Control activities for feral hogs implemented on the Refuge Complex primarily utilize State animal damage control agency personnel who capture and remove hogs or kill on-site. In addition, Refuge law enforcement personnel conduct periodic lethal control activities.

Refuge Complex Grazing Program

The Refuge Complex implements a controlled grazing program and has developed specific grazing plans to address the habitat objectives for each grazing unit. These plans are flexible and are adapted as necessary allowing for droughts, floods, and other circumstances. Grazing strategies include variations in the number of cattle (pressure) per unit, timing (cool vs. warm season), duration, and are developed for specific habitat objectives of each grazing unit. Stocking rates for the cool season grazing period are determined annually according to the quantity and condition of forage on the grazing units.

The Refuge Complex grazing program relies on livestock provided by local ranchers. The animals are referred to locally as a crossbred variety and typically contain strains of bramha, hereford, angus, and others. Anahuac NWR implements cool season and summer cattle grazing on various marsh and upland units. There are currently two grazing permittees on Anahuac NWR. Units grazed include Old Anahuac (several subunits), East Unit (also several subunits), and the Middleton Tract grazed by one permittee, and the Pace Tract and Roberts-Mueller Tract grazed by the second permittee. The grazing program is an effective tool in the control of the native red rice in farm fields of this Refuge. This is one primary grazing permittee on McFaddin NWR and grazing is permitted on a limited basis on Texas Point NWR. Annual animal unit months (AUM)'s vary by year and tract. During the 2001-2002 grazing season Anahuac NWR permitted 14,352 AUM's of grazing, McFaddin NWR permitted 10,240 AUM's, and Texas Point NWR permitted 845 AUM's (Booz Allen Hamilton (BAH), 2003).

Grazing within the Refuge Complex is dependent on natural weather patterns and the manipulation of the water that is control throughout the complex. Access to grazing units is provided via levee, canal, ditches, USFWS management roads along with public roads and bridges.

Refuge Complex Fire Management

The objective of the Refuge Complex fire management program is to manage prescribed fire and wildfire in a manner beneficial to native plant and animal communities and ecological functions, while providing for public and employee safety and minimizing negative impacts to the surrounding communities. Prescribed burning activities and wildfire response tactics are based on protecting public and employee safety, habitat/biological objectives, and minimizing air quality impacts from smoke on local communities and the region's air sheds.

The most recent 10-year fire occurrence history (1993 to 2002) for the Complex indicates an average of 28 fires per year with an average fire size of approximately 425 acres (Fire Management Information System). The relatively large average fire size is indicative of the flashy fuels present on the Refuge Complex and the fact that a common suppression strategy involves burning out from established fuel breaks.

In general, areas within the Refuge Complex are burned on a two-year rotation; however, the actual vegetation condition of the unit dictates the need for a burn. Most burns in marsh units are conducted during the fall and winter months, while burning in upland units occurs primarily in late winter and early spring. Prescribed burning for habitat management purposes occurs throughout the complex and utilizes all access structures associated with water management and motorized vehicles which do not permanently harm refuge habitats or wildlife.

Refuge Complex Cooperative Farming Program

The USFWS manages a cooperative farming program for certain areas within the Complex. The program supports rice farming and occurs solely on the Anahuac NWR. Currently four permittees farm approximately 500 to 800 acres of rice on an annual basis in the cooperative farming program. The USFWS recognizes the benefits of having rice produced on the refuge as a potential food source for migratory birds. Rice operations within the refuge must be compatible with wildlife goals. Thus, USFWS requires permittees to meet certain stipulations including: use of only approved herbicides, maintenance schedules, use of certified rice seed and restrictions on second growth harvests. The proportion of uplands utilized for rice production and pastureland in the project area varies from year to year. Currently, nearly two-thirds of the total acreage in the cooperative farming program is managed as an organic rice farming operation.

Rice production requires seasonal flooding which creates emergent wetland habitat utilized by many avian and other wildlife species throughout the spring and summer. During fall and winter flooded rice stubble and rice fallow, plowed fields, water leveled fields, weedy fields, ryegrass fields and pastureland in the project area provide habitats which historically have supported large concentrations of wintering and migrating waterfowl, shorebirds and wading birds.

Refuge Complex Recreational Resource Use

Public lands in the area support a variety of recreational opportunities. According to Executive Order 12996 (1996), the USFWS is to provide recreational opportunities that include hunting, fishing, wildlife observation, photography, and environmental education and interpretation as priority uses within the National Wildlife Refuge System (NWRS). Congress reaffirmed this with the passage of the National Wildlife Refuge System Improvement Act of 1997. All of the above priority public uses are currently allowed on the Complex and many are being expanded pending their compatibility with the purpose for which the refuge was established, (e.g., to provide and maintain quality wintering and migrational habitat for the migratory bird resource).

According to BAH (2003) beach and water use in 2002 accounted for 47.5 percent of the total public use with 26.6 percent used for fishing, 18.1 percent used for wildlife observation, 6.5percent used for hunting, with less than 1 percent used for each of the following: office visits, outdoor education, and other

recreational uses. Hunting opportunities on the Refuge Complex are allowed on about 40 percent of the lands which is the most allowable by law. Fishing opportunities require no permit and 24 hour access is allowed in some areas. Bank and boat fishing is popular in many bayous, tidal streams, and larger lakes throughout the Complex (BAH 2004).

Overall, between 2001 and 2002 visitation to the Refuge Complex increased 2.5 percent. Beach use accounted for 87 percent of McFaddin NWR use, while fishing accounted for 75 percent of the use at Texas Point NWR, with 42 percent of the use at Anahuac NWR for wildlife observation (BAH 2003)

Conclusion: All three of the areas generally appear to have been affected primarily by oil & gas activities and refuge management activities, particularly water management, with the imprint of human uses and activities substantially noticeable. None of these areas meet the criteria for “naturalness”.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation Criteria

In addition to meeting the size and naturalness criteria, a SA must provide outstanding opportunities for solitude or primitive recreation (BLM 2001, USFWS 2004a, b). The area does not have to possess outstanding opportunities for both solitude and primitive and unconfined recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values.

Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means non-motorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk, self reliance, and adventure. These two opportunities “elements” are not well defined by the Wilderness Act but, in most cases, can be expected to occur together. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential (BLM 2001, USFWS 2004a, b). Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

In the wilderness inventory for the roadless areas within the project area, the following factors and their cumulative effects were the primary considerations in evaluating the availability of outstanding opportunities for solitude or primitive and unconfined recreation:

- size
- availability of vegetative screening
- proximity to or attached to the mainland at low tide in an area with intensive public use
- presence of water control structures which includes management of the water regime, maintenance of the structures themselves, and the access to and from the structures
- oil & gas exploration including the 3-D seismic surveys that are underway and the potential for additional 3-D seismic surveys within the entire Refuge Complex (USFWS 2005b)
- current and future oil and gas operations and associated structures
- current and future refuge management activities including future recreational development activities
- substantial private ownership with developments such as private residences and associated incompatible activities
- significant presence of oil & gas facilities for production, refinement and storage that makes the area unsafe or unattractive for public use

Evaluation of Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The three possible SA's were evaluated for the factors considered in determining the availability of outstanding opportunities for solitude or primitive and unconfined recreation. Most of the factors considered are the same as the ones addressed under the section evaluating "Naturalness".

The issues addressed for each of the three areas under the following listed activities in the "Naturalness" section are also considered in this evaluation:

- Mineral Resources and Related Exploration and Development
- Refuge Complex Water Management
- Refuge Complex Invasive Species Management
- Refuge Complex Grazing Program
- Refuge Complex Management Fire Management
- Refuge Complex Cooperative Farming Program
- Refuge Complex Recreational Resource Use

Conclusion: All three of the areas offer some opportunities for both solitude or primitive and unconfined recreation. However, activities associated with the oil & gas activities, pipeline easements, current public uses, water management and other Refuge management activities affect outstanding opportunities for solitude or primitive and unconfined recreational activities. Opportunities for solitude or primitive and unconfined recreation were judged to be less than outstanding for all three areas.

Supplemental Values

Supplemental values are defined by the Wilderness Act as "...ecological, geological, or other features of scientific, educational, scenic, or historic value" (USFWS 2004b)." These values are not required for wilderness but their presence is documented in Chapter 3- Affected Environment in the Texas Chenier Plain Refuge Complex CCP/EIS and is evaluated in this Wilderness Review.

Evaluation of Supplemental Values

All three of the areas offer outstanding ecological values with features of scientific, educational, and scenic interest. The undeveloped coastal area along Highway 87 that parallels McFaddin NWR offers a unique, and increasingly rare, opportunity to observe natural processes. The marshes, prairies and woodlots of the Chenier Region comprise hemispherically important biological areas. Regionally, all of the areas provide important habitats for Federal- and State-listed, and rare and declining plant and animal species.

SUMMARY: NONE OF THE AREAS MEET THE REQUIRED CRITERIA FOR WILDERNESS AND THEREFORE NONE WILL BE RECOMMENDED FOR INCLUSION IN THE NATIONAL WILDERNESS PRESERVATION SYSTEM.

APPENDIX G: RONS AND MMS PROJECTS

RONS Projects for Anahuac, McFaddin and Texas Point NWRs							
Refuge	Project Title	RONS #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Restore Native Coastal Tallgrass Prairie	97009	Restore 5,000 acres of fallowed cropland on the refuge to native coastal prairie. Less than 1% of the Texas Gulf Coast's historical tallgrass prairie now remains due to conversion for agricultural uses and urban development. This important coastal prairie ecosystem component will be restored through removal and control of exotic brush species (Chinese tallow, McCartney Rose). Natural hydrology will be restored by reestablishing former contours and elevations, and seed drilling and hay mulching using native grass species. Refuge grasslands provide important habitat for several declining bird species such as Henslow's and Le Conte's sparrows, dickcissel, black rail, and white-tailed kite, and vital nesting habitat for the resident Mottled Duck. Another goal of prairie restoration is to ultimately provide an additional release site for the endangered Attwater's prairie chicken.	15	77	0	3
Anahuac NWR	Restore and Manage Freshwater Coastal Wetlands	97008	Provide freshwater wetland habitat through the management of 1,000 acres of seasonal wetlands. Shallow freshwater wetlands have suffered the greatest decline of all wetland types on the Texas Gulf Coast and remain most susceptible to ongoing drainage and conversion to other land uses. The presence of high quality shallow freshwater wetlands on the refuge has become increasingly important as cultivated rice acreage has declined significantly in the area. Fallowed croplands quickly convert to monotypic stands of exotic Chinese tallow which provide little or no value to waterfowl and other migratory birds. Project includes purchase of a pump, installation of culverts, water control structures, and levees, and support for annual operations.	70	60	0	5

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Conduct Wildlife and Habitat Surveys	97058	Provide biological staff to conduct essential wildlife and habitat surveys and monitoring. Coastal wetland ecosystems are extremely dynamic, requiring systematic monitoring to understand relationships between management practices, natural disturbances and wildlife habitat responses. This biological staff position will provide the scientific information needed to guide refuge management practices including water management, prescribed burning, controlled grazing, and wetland and grassland restoration. This coastal refuge's marshes, prairies, and woodlands provide vital habitats for wintering and migrating waterfowl, shorebirds, wading birds, neotropical migrants and raptors, and important nursery habitat for many fish and shellfish species which support Galveston Bay's extensive recreational and commercial fishing industries.	65	63	1	6
Anahuac NWR	Expand Native Prairie Restoration Program	98059	Acquire basic equipment needed for native prairie restoration. Less than 1% of the Texas Gulf Coast's historical native tall grass prairie remains today, as most have been converted for agricultural uses and urban development. Equipment needs include a round baler, round bale mulcher, grass drill, bale unroller, crimper, harrow, hydro-axe, seed drier, seed cleaner, and 115-horsepower tractor. Native coastal grasslands are extremely important migrational habitats for many declining grassland songbird species, and provide vital nesting habitat for the resident Mottled Duck. This project will greatly increase opportunities for partnerships with private landowners to accomplish native grassland restoration on a landscape scale.	190	15	0	7

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance Prairie Restoration and Controlled Grazing Programs	98034	Prairie restoration and grazing programs will be expanded and enhanced through the establishment of a Plant Ecologist position, purchase of equipment to develop prairie plant propagation techniques, and increased habitat monitoring (including data collection and computer analyses). Less than 1% of the Texas Gulf Coast's historical tallgrass prairie now remains, as most has been converted for agricultural uses and urban development. Techniques need to be developed to help restore this native prairie that provides important habitat for several declining grassland songbird species and nesting habitat for the resident Mottled Duck. This project will greatly enhance partnership opportunities with private landowners, many of whom are interested in restoring native grasslands and refining grazing practices to benefit wildlife.	65	89	1	8
Anahuac NWR	Improve Coastal Wetlands Management	98003	Develop a water management plan for the refuge complex. Alterations of natural hydrology have restricted freshwater inflows and increased saltwater intrusion in the Texas coastal marshes, negatively impacting their ecological integrity. Active management and restoration are necessary to maintain fish and wildlife values. Watersheds and water management infrastructure will be mapped, monitoring of water usage will be conducted, additional water rights needs and water rights amendments evaluated and adjudicated, and a GIS will be used to model water management regimes and identify future project needs. Coastal marshes on the Texas Chenier Plain Refuge Complex provide vital habitat for wintering Central Flyway waterfowl, shorebirds and wading birds, and for many of Galveston Bay's and Sabine Lake's important fish and shellfish species.	115	9	0	9

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Support for Wetland Restoration	98004	Provide a Geographic Information System (GIS) specialist to develop mapping capabilities at Texas Chenier Plain Refuge Complex. Expansion of this 105,000-acre Refuge Complex and the dynamic nature of this coastal ecosystem have created new management challenges and responsibilities. Advanced GIS technologies and expertise have become prerequisite tools for effectively managing the Complex and meeting conservation priorities of this coastal ecosystem. GIS technologies and a GIS computer specialist position will support management and restoration of coastal wetlands, ongoing land acquisition, and Comprehensive Conservation Planning (CCP). The Refuge Complex CCP and associated Environmental Impact Statement were initiated in FY 1999, and this project will directly support these efforts.	65	89	1	10
Anahuac NWR	Conduct Non-game Bird Surveys	97014	Conduct surveys of migratory songbirds in coastal woodlots, riparian corridors, prairies, and seasonal wetlands on the refuge. These habitats provide important wintering and migrational habitats for songbirds, shorebirds and wading birds. Several are listed species or species of management concern, including Henslow's sparrow, piping plover, and reddish egret. Population and habitat use data is needed to maintain and manage public uses on the refuge, including wildlife observation and environmental education, to ensure that these priority uses remain compatible. Improved biological data will also allow refinement of refuge habitat management activities aimed at benefiting these sensitive species. This monitoring effort supports the bi-national Gulf Crossings Project, a cooperative project between Mexico and the U.S.		23	0	11

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Restore Coastal Wetlands	97006	Restore 100 acres of emergent coastal wetlands on the refuge by constructing wave barriers and planting smooth cordgrass. Shoreline erosion along East Galveston Bay has resulted in extensive wetland losses, and threatens over 15,000 acres of wetlands on this coastal refuge. Alterations of hydrology through construction of navigation channels, channelization of bayous and interruption of freshwater inflows have greatly increased erosion rates. Additional benefits include protecting existing wetlands by slowing or preventing additional shoreline erosion and restoring wetland habitats. This project expands upon proven methods and highly successful partnerships with the Galveston Bay Foundation, Natural Resources Conservation Service, industry, and volunteers.		117	0	12
Anahuac NWR	Improve Refuge Habitat Management Program	7	Provide an entry-level Refuge Operations Specialist position to improve habitat management activities in wetlands, resource protection through law enforcement, conservation easement monitoring, fire management, and overall administration of refuge public use programs. Habitats on these coastal refuges are intensively managed through water level management, prescribed burning, grazing and farming, and restoration of native grasslands and wetlands. Annual visitation to Anahuac NWR exceeds 70,000 annually, for uses including hunting, fishing, and wildlife observation. Moody NWR consists of 3,500 acres of coastal wetlands and prairie under a conservation easement. This trainee position will provide a full spectrum of refuge management and program administration experiences, and an opportunity to increase workforce diversity through the placement of Student Career Employment Program (SCEP) students.	65	75	1	13

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Manage Refuge Oil and Gas Activities	98011	Provide a GS-9 Resource Specialist to manage oil and gas activities, including environmental compliance, permitting, program oversight, and restoration. Oil and gas activity on this 102,946 acre coastal Refuge Complex includes two sizable active fields with all support facilities, over 25 small active and inactive wells, 20 pipelines, and several storage facilities. Additionally, oil and gas exploration through 3-D seismic activity is increasing on the Texas Gulf Coast. Over 40,000 acres of the Complex lands have been surveyed over the last 3 years, three new drilling programs have been implemented, and additional development activities are being planned. Without adequate oversight and coordination of oil and gas exploration and development activities within this fragile wetland environment, severe adverse impacts to valuable fish and wildlife habitats will occur.	65	75	1	14
Anahuac NWR	Improve and expand moist soil management program	98060	Enhance moist soil management capabilities for wetland restoration and management by acquiring needed equipment. Shallow freshwater wetlands along the upper Texas Gulf Coast have suffered the highest historical rate of wetland loss and continue to decline. An ongoing decline in cultivated rice acreage has exacerbated this trend. Equipment needed to conduct moist soil management includes a harrow, mower, fuel tank, scratcher/blade, roller/chopper, land level, and levee plow. This coastal refuge hosts hundreds of thousands of wintering waterfowl of the Central Flyway and management of moist soil units and cultivated rice is critical to maintaining high quality habitat for these species. These units also provide vital habitat for shorebirds.	113	9	0	1

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Protect refuge visitors and enhance resource protection	98007	Visitor safety and resource protection will be enhanced by establishing a refuge officer position for the Anahuac NWR. Resource values are threatened by trespass, migratory bird violations, alligator poaching, and facilities by vandalism and theft. Much of this coastal Refuge is remote and accessible only by boat, posing dangers to recreational fisherman, boaters, and hunters and logistical difficulties for law enforcement activities. Enhancing the safety and quality of experience of its over 105,000 annual visitors and the protection of its natural and cultural resources are the focus of the Refuge Complex law enforcement program.	65	68	1	2
Anahuac NWR	Conduct longterm studies on Mottled Duck populations	97018	Conduct as series of long term investigations to evaluate causative factors leading to the decline of Mottled Ducks in Upper Texas Coast marshes. The Mottled Duck is a resident species of the Texas Gulf Coast, and refuge habitats provide critical year-round habitat for nesting, brood rearing, molting, and wintering. This project involves a long term study to classify habitat characteristics of currently occupied habitats including landscape level preferences, predator relationships on nest and brood success, locate sources of current lead contamination, measure breeding pair density responses to intensive management and habitat improvements, and banding work to provide information on population dynamics, survival rates and seasonal distribution of Mottled Ducks. Information will be collected through research contracts, seasonal hires, purchase of research equipment, fuel, and supplies.	14	39	0	3

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance controlled grazing program through habitat monitoring	98048	Improve management of controlled grazing program. Information is needed to assess the overall ecological effects of grazing to ensure a holistic management approach using this important tool. Over 18,000 acres of the Anahuac National Wildlife Refuge are grazed on a rotational basis to maintain habitats in early successional stages favorable to many waterfowl species, to enhance and maintain plant diversity, to control exotic woody plants, and to enhance the vigor of grasslands. New and expanded surveys of plant community successional changes and wildlife response on grazed units will be conducted. Wetlands and prairie on this coastal Refuge support over 200,000 wintering ducks and geese annually, and equally impressive numbers of shorebirds, wading birds, neotropical migratory songbirds, and raptors.	16	15	0	4
Anahuac NWR	Monitor marsh elevation change relative to fire, grazing and water management	97021	This is a long-term study will monitor marsh elevation changes in response to various refuge management practices including fire, water and grazing management. Relative sea level rise poses serious long-term threats to coastal marshes. The ability of marshes to gain elevation or accrete vertically is critical to their health and survival. Monitoring will be conducted to determine fire effects under differing burn frequencies and intensities, burn timing, and among marsh types, grazing intensities and water management.		49	0	5

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance education and interpretive opportunities for refuge visitors	98037	To maximize benefits to refuge visitors, informational brochures for hunting, fishing, mammals, reptiles and amphibians, and plants, wildflowers, butterfly habitat and Willows map, will be developed, and the new general brochure and bird list will be updated and printed regularly to keep up with high demand. Over 70,000 people visit this coastal refuge annually to fish, hunt, observe and photograph wildlife, and to participate in environmental education activities. The refuge is within a 1-hour drive of over 6 million people in the Houston Metroplex and Golden Triangle areas, and visitation is increasing each year. Written information provides an effective and efficient means of providing information, and this project will ensure that these resources are always available to refuge visitors.	29	15	0	6
Anahuac NWR	Enhance visitor and resource protection	98067	Enhance safety and quality of experience of over 70,000 annual visitors and protection of natural and cultural resources. Much of the refuge is remote and accessible only by boat, posing dangers to recreational fisherman, boaters, and hunters and logistical difficulties for LE activities. Resource values are threatened by trespass, migratory bird violations, alligator poaching, and facilities by vandalism and theft. This project involves the purchase of needed equipment and supplies to support law enforcement activities including: 1) computer, GPS unit, radio and software for full time LEO; 2) canoe for waterfowl patrols; 3) all-terrain vehicle and trailer; 4) cellular phones for improved communications; 5) security system for refuge facilities; 6) radar gun and drug and alcohol test equipment 7) freezer for evidence storage; and 8) gun safe. Reoccurring base needs includes uncontrolled overtime for officers, training and travel costs and annual supplies.	85	16	0	7

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Protect refuge resources by enhancing biological data collection and analysis	98056	Acquire basic equipment and supplies needed to fully implement the Anahuac NWR biological program. Coastal ecosystems are highly complex and dynamic, and sound scientific data is needed to track changes in plant communities, trends in habitat quality and quantity, and fish and wildlife response to habitat changes and management practices. Equipment needs include lap top computers, data loggers, GPS units, spotting scopes, four-wheel all-terrain vehicle, airboat, banding supplies, and publications and other information resources. This coastal refuge hosts thousands of Central Flyway waterfowl each winter, and provides vital habitat for other migratory birds including shorebirds, wading birds, songbirds, and raptors. Listed migratory bird species found on the Refuge include the endangered piping plover and brown pelican.	39	10	0	8
Anahuac NWR	Restore coastal woodlot	98035	Restore a 15-acre coastal wood lot on the Anahuac NWR. Development, sand and gravel mining, conversion to pasture and invasive species such as the exotic Chinese tallow have significantly impacted coastal woodlots in the Chenier Plain region of southwestern Louisiana and southeast Texas. This project involves Chinese tallow control, restoring natural hydrology, and purchase of trees and planting. Coastal woodlots provide vital migrational habitat for many neotropical songbirds, especially in spring when these habitats represent the first landfall for hundreds of thousands making nonstop flights across the Gulf of Mexico from Mexico's Yucatan Peninsula. Migratory songbirds utilize these wooded habitats for resting and foraging, to restore energy reserves prior to continuing their northward migration.	30	0	0	9

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance shorebird management through monitoring	98052	Implement surveys to determine numbers and species of shorebirds using the Refuge, timing of use by individual species, and habitat preferences. Ongoing losses of shallow freshwater habitat due to declines in the rice industry have increased the importance of implementing shorebird management activities on the Refuge. This project involves a 3-year shorebird monitoring in rice fields, moist soil units, and natural wetlands. Using the information collected, current shorebird management practices involving water level manipulation will be refined to provide maximum benefits to this important avian resource. Refuge habitats support over 100,000 shorebirds annually during spring and fall migrations. Thirty-five species of shorebirds have been recorded on the Refuge.	36	3	0	10
Anahuac NWR	Develop Interpretive displays for public use facilities	3001	Develop interpretive displays, slide programs, videos, and an interactive video display using a remote microwave camera for use in public use facilities on the refuge. Topics to be interpreted include coastal wetlands, prairies, habitat management tools (fire, water, moist soil, grazing and restoration), rails, alligators, cultural and historic resources, and exotic and invasive species. This coastal refuge is within one hour's drive of over 6 million people including the Houston Metroplex, resulting in high demand for recreational and educational opportunities. The current annual visitation of the refuge exceeds 70,000 and is expanding rapidly.	89	0	0	11

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance controlled grazing habitat management program	99055	Improve the Refuge grazing program. Grazing is used to maintain and enhance grassland and wetland habitats on over 70,000 acres of the Texas Chenier Plain Refuge Complex. Needed improvements to ensure continued compatibility of this management tool include revising rotational grazing units by installing fences and cattle guards, and improving water availability through development of water wells. Controlled livestock grazing is an important wildlife management tool on this coastal refuge, providing a cost-effective means of maintaining quality habitat for wintering waterfowl, shorebirds, and grassland songbirds. Anahuac NWR host up to 200,000 Central Flyway ducks and geese annually and equally impressive numbers of shorebirds, wading birds, and neotropical songbirds.	85	7	0	12
Anahuac NWR	Conduct Wildlife Habitat Management Workshops for Private Landowners	2002	Conduct five workshops for private landowners and other agency personnel in Chambers, Jefferson and Galveston Counties to demonstrate marsh management and restoration, moist soil management, prairie restoration and management and woodlot management and restoration techniques. Highlight all available private lands programs and grant opportunities. Provide on going technical assistance to landowners wishing to restore wetland, woodlot or grassland habitat. Develop a demonstration program and interpretive signs on the refuge for private landowners. The effort will involve producing print materials signs and course materials for the program by working with area State and County Extension, Texas Parks and Wildlife, Ducks Unlimited and Fish and Wildlife ecological Services offices. We estimate over 5,500 acres of wildlife habitat will be enhance or restored as a result of this outreach and technical assistance effort and over 200 private landowners will benefit from these services.	20	8	0	13

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance restoration of native prairie through study and monitoring	98049	Establish systematic monitoring program of prairie restoration projects on Anahuac NWR. Over 5,000 acres of fallowed crop land will be restored to grassland habitat on the refuge over the next 25 years. Monitoring plant community and wildlife responses is needed to assess the success of various restoration methodologies. Information will be used to guide future prairie restoration efforts and will provide baseline information for use in providing technical assistance to private landowners. Grassland restoration to support grazing operations will be a viable alternative to the loss of rice agriculture for many area ranchers and farmers, and there is great partnership potential between the USFWS and landowners using the Partners for Fish and Wildlife program.	107	0	0	14
Anahuac NWR	Conduct Yellow Rail study	98047	Study the wintering and migration habitat utilization and ecology of the yellow rail on Anahuac NWR. Little is known of this secretive marsh species in its wintering habitat along the Texas Gulf Coast. Densities of this species on the Refuge are apparently the greatest of any area in the region, and Refuge and surrounding coastal marshes are likely critical to the survival of this species. The Refuge is intensively managed to provide quality wintering and migrational habitat for waterfowl, and information on other sensitive migratory bird species is needed to ensure holistic management in this dynamic coastal wetland and prairie ecosystem. This project has high partnership potential with several universities, Friends of Anahuac Refuge, and local volunteers.	69	0	0	15

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Control invasive plants in marsh and prairie habitats	2001	Common reed, cattail, giant cut-grass, California bulrush alligator weed and rattlebox occur in open water habitats in marshes on the refuge. These invasive plants establish along pond periphery and if not controlled encroach into open water areas forming dense homogeneous stands covering open water areas. This encroachment impacts waterfowl use, reduces the quality of available Mottled Duck breeding pair ponds and reduces use by other wetland waterbirds. Seacoast sump weed, big leaf sump weed, and eastern baccharis have become invasive in native and salty prairie habitats on the refuge. High densities of these invasive plants reduce use by many avian species such as Mottled Ducks, seaside sparrows, black rail, yellow rail, sedge wren, LeConte's sparrow and Sprague's Pipit. This project will purchase the needed equipment to mechanically mow pond boundaries, modifying water control structure to utilize salinities to manage nuisance plants and utilize an integrated approach of mowing, fire, grazing and herbicides to reduce the nuisance plant dominance in upland prairie habitats.	187	17	0	16
Anahuac NWR	Conduct study on black water impacts on submerged aquatic plants	97022	Conduct longterm research study to determine the causes of the "black water" phenomenon in refuge and surrounding coastal marshes. Periodic occurrences of this phenomenon, characterized by low dissolved oxygen and high water temperatures, result in a loss of aquatic vegetation, fish kills, and other detrimental impacts. This study will examine other factor limiting the establishment and growth of submerged aquatic plants. Under these conditions, habitat quality for wintering and migrating waterfowl and other migratory birds is significantly reduced. Information on causative factors will facilitate development of management practices to prevent or minimize its occurrence. This coastal refuge's marshes provide vital wintering and migration habitat for migratory birds including Central Flyway waterfowl, shorebirds and wading birds, and nursery habitat for many recreationally and commercially important fish and shellfish.		45	0	17

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Develop trail and interpretive signs for Butterfly Habitat and Willows Area	3000	Develop an new accessible trail system and interpretive materials for the Butterfly and Hummingbird Habitat and the Willows. This project involves developing an interpretive trail system with trail guide including: 1)plant identification label system; 2)landscaping for butterfly and hummingbirds with native plants brochure; 3)trial guide brochure; 4)interpretive panels; and 5) concrete accessible trail. This coastal refuge is within one hour's drive of over 6 million people including the Houston Metroplex, resulting in high demand for recreational and educational opportunities. The current annual visitation of the refuge exceeds 70,000 and is expanding rapidly. The new Butterfly Habitat and the Willows woodlot are among the most popular sites on the refuge for wildlife observation and photography and important components of our environmental education program.	76	0	0	18
Anahuac NWR	Increase biological monitoring and habitat management with expanded volunteer program	4	Enhance the Anahuac NWR Volunteer Program by providing needed operational support. Volunteers have become the lifeblood of the refuge, contributing over 11,000 hours annually to a variety of refuge programs. General supplies including personal protective equipment is needed, and equipment and facility needs include two vehicles, computers, printer, software and office furniture and supplies. Reoccurring base needs include stipends for intern program, fuel, utilities, phones, awards, drinking water, safety equipment and boots. Volunteers conduct habitat and wildlife surveys, conduct tours for visitors, coordinate the environmental education program, and assist with habitat management. Community involvement has bred pride and commitment to the refuge, and vice versa. Great opportunities exist for bringing non-local volunteers to the refuge to further develop this successful program.	70	20	0	19

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Conduct baseline inventory of refuge amphibians and reptiles	97012	Conduct essential inventory of reptiles and amphibians on the Anahuac NWR. Data on amphibians and reptiles, including species composition and relative abundance, are currently lacking. Threats to these sensitive species, which are often early indicators of declining ecosystem health, include loss of freshwater wetlands and contaminants (primarily agricultural pesticides). Species of concern include the smooth green snake, Texas diamondback terrapin, and the alligator snapping turtle. Enhanced biological data gained through systematic surveys will be used to evaluate population status of reptiles and amphibians occurring on the refuge, and to ensure that refuge management practices are consistent with maintaining viable populations. This project will be implemented through a partnership with a university or the Biological Resources Division of the U.S. Geological Survey.	48	0	0	20
Anahuac NWR	Install interpretive exhibits at waterfowl hunt check station	5	Install interpretive exhibits at the waterfowl hunt check station to provide hunter education and orientation. This facility provides information to the over 3,000 hunters using the East Unit Hunt Area each year, and is used to collect important biological data. This project will equip this new facility with two interpretive panels, two exhibits, television, VCR, and computer. Exhibits will include information on the white goose overpopulation problem, hunter ethics, and declining coastal wetlands, as well as partnership programs aimed at restoring and protecting habitats on private and public lands in the region. Educational videos will be shown, and the computer will allow the check station attendant to enter harvest and aerial waterfowl data and display this information.	46	0	0	21

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Conduct study to determine population densities and habitat utilization by black rails	98051	Determine habitat use by and relative abundance of black rails on Anahuac NWR. Relatively little is known of this secretive marsh bird's wintering habitat requirements, and it also may be a nesting species on the Anahuac NWR. Additional scientific information is needed to ensure conservation of this sensitive species, and to ensure that refuge habitat management practices are consistent with its habitat needs. This two-year study will include conducting call surveys, and capture and radio marking rails to determine habitat utilization and nesting status. The black rail is state-listed as a Threatened species in Texas, and is a Federal Species of Concern. Shallow freshwater marshes and wet prairies, believed to be the black rail's preferred habitats, are locally rare and declining habitat types.	89	0	0	22
Anahuac NWR	Improve coastal marsh management capabilities with specialized equipment	2	Purchase specialized equipment to provide access for coastal marsh management on Anahuac NWR. Coastal marsh habitats are highly sensitive and easily damaged, and specialized equipment which minimizes plant damage and soil compaction are required for routine management operations including prescribed burning, water management, habitat monitoring and wildlife surveys. A low ground pressure amphibious aluminum tracked buggy and amphibious all terrain vehicle will be purchased. The Refuge's coastal marshes support high biological diversity, including several threatened and endangered species, a variety of migratory birds, and many of Galveston Bay's recreationally and commercially important fish and shellfish.	262	21	0	23

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance and expand public outreach and education with professional audio/visual programs	98040	Enhance interpretation of the Refuge, its resources, management activities, and visitor opportunities by increasing the quality and quantity of off-site presentations. Rapidly expanding nature tourism along the Texas Coast has created a critical need for additional outreach through interpretation and environmental education, both on and off-site. A video will be produced and audio visual equipment needed for outreach programs purchased. The Refuge's location within one hour's drive from over 6 million people in the Houston Metroplex and Golden Triangle region provides an ideal opportunity for highly effective outreach and education.	32	0	0	24
Anahuac NWR	Develop an audio tour route program and mobile interpretive exhibit	98036	Develop audio interpretive system for vehicles and mobile interpretive exhibit to be used a various festivals and expos. The audio system and mobil exhibit would interpret the variety of coastal habitat types including wetlands, grasslands, and woodlands, fish and wildlife resources, cultural resources, and management of the refuge. The refuge auto tour route provides visitors excellent opportunities to view a variety of wildlife and habitats. The audio interpretive system and mobile exhibits will add significantly to interpretive facilities on the Refuge, will be a highly effective outreach and educational tool, and will enhance refuge on-site and off-site outreach capabilities. Based on the latest Fish and Wildlife Service data available, the additional visitors to this area are expected to contribute \$25,513 annually to the local economy. Project has high partnership potential with Friends of Anahuac Refuge.	41	0	0	25

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance waterfowl disease contingency response capabilities	97011	Enhance preparedness and response capabilities to minimize deleterious impacts of waterfowl disease outbreaks, including the protection of public safety. Disease outbreaks in these habitats are regularly documented, and have potential to impact extremely large numbers of migratory waterfowl and other migratory birds. The project ensures that materials/equipment and personnel preparedness are maintained according to approved Disease Contingency Plan, and supports aerial monitoring to provide early detection of disease problems. The coastal marshes and rice prairies of southeast Texas provide wintering and migration habitat for millions of ducks and geese of the Central Flyway.	15	10	0	26
Anahuac NWR	Support expanding environmental education program	98043	Maintain and enhance high quality environmental education program. The Refuge Environmental Education program is expanding rapidly, and now reaches approximately 1,000 students per year. Audiovisual programs, interactive displays, written materials will be purchased to update and expand curricula for primary and secondary through high school educational use. Materials will interpret coastal wetland, prairie, woodland and bottomland forest habitats and resources. Volunteer participation and community partnerships are the mainstay of this important refuge program. The Friends of Anahuac Refuge are an established partner on this project.	22	10	0	27

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Enhance and expand recreational and educational opportunities	98012	Expand and enhance the Refuge environmental education and interpretation programs, liaison with the Refuge Friends group, community outreach, and law enforcement programs by establishing an entry level Outdoor Recreation Planner position. This coastal Refuge is within one hour's drive of over 4 million people in the Houston Metroplex, resulting in high demand for recreational and educational opportunities. Annual visitation to this coastal refuge exceeds 70,000 and is expanding rapidly. Public uses occur year round and include wildlife observation, environmental education and interpretation, recreational fishing, and waterfowl hunting. The Refuge's environmental education program now serves over 1,500 students annually through on and off-site programs and activities.	65	91	1	28
Anahuac NWR	Increase interagency coordination	10	Increase interagency coordination on significant issues affecting habitats and fish and wildlife resources on these coastal refuges. These include coastal erosion, beneficial uses of dredged material, wetland and native prairie restoration, oil and gas development and right-of-way proposals for roads and pipelines. A Deputy Project Leader position for the Texas Chenier Plain Refuge Complex will be established to increase coordination with state agencies including the Texas General Land Office, Texas Parks and Wildlife Department, and federal agencies including the U.S. Army Corps of Engineers, National Marine Fisheries Service, and Federal Highway Administration. This Refuge Complex protects and manages over 103,000 acres of coastal wetlands, prairies, and woodlots.	65	121	1	29

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Native prairie and coastal woodland restoration	98016	Enhance and increase native prairie and coastal woodlot restoration and management activities on Anahuac NWR through the addition of a Tractor Operator position. Operation of farm machinery is required for restoration activities, including tractors, discs, scrapers, mowers, and augers. Most of the historical 9-million acre tallgrass coastal prairie of Texas and Louisiana has been lost through conversion to other land uses, and several species of grassland birds which winter in the region are in decline. Species of concern include Henslow's and Le Conte's sparrows, dickcissel, and black rail. Coastal woodlots of the Chenier Plain region provide vital habitats as the first landfall for many neotropical migratory songbirds making a Trans-Gulf migrations.	65	71	1	30
Anahuac NWR	Enhance and expand public outreach	98010	To increase cooperation and coordination with elected officials, other governmental agencies, the media, and the public, an outreach specialist position will be established serving the Texas Chenier Plain Refuge Complex. The natural resources of the upper Texas Gulf Coast are a national treasure, and the importance of conservation here has long been recognized. Ongoing expansion of this coastal Refuge Complex, implementation of the Texas Chenier Plain Habitat Stewardship Program (a multi-partner habitat conservation effort on 185,000 acres), and the Texas State Highway 87 reconstruction project are among the major issues related to USFWS activities in this region.	65	107	1	31

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Improve visitor services through expanded environmental education program	1	Meet the growing demand for environmental education and visitor services at Anahuac NWR by establishing an environmental education specialist position. Refuge volunteers administer the Refuge's extremely successful environmental education program. The rapid expansion of this program has resulted in a need for full-time staff oversight and participation--over 1,000 students are now involved in on-site environmental education programs each year. This coastal Refuge's ideal location within a 1-hour drive of over 4 million people in the Houston Metroplex has created a great demand for environmental education and visitor services. The environmental education program has also dramatically increased community involvement in and support for the Refuge and its overall mission.	65	67	1	32
Anahuac NWR	Enhance refuge management activities and staff and public safety	98069	Purchase and install two remote weather stations on the Anahuac NWR. Weather greatly affects ecological processes in this dynamic coastal ecosystem, and collection of weather data is an important component in overall ecological monitoring. Currently, assessment of local weather conditions is not possible. Availability of accurate local weather data can also have major impacts on refuge management activities and program safety. For example, monitoring wind and weather conditions while suppressing wildfires and conducting prescribed burns is critical to ensuring staff and public safety, as well as to ensure maximum natural resource benefits of this management activity.	32	3	0	33

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Anahuac NWR	Increase visitor services	98017	Enhance visitor services by establishing a maintenance worker position to provide timely and improved maintenance of public use facilities on Anahuac NWR. Facilities including observation platforms and boardwalks, trails, comfort stations, interpretive and directional signage, boat ramps, boundary signage, and fencing require regular maintenance for protecting visitor safety and enhancing visitor experiences. Regular upkeep is necessitated by the harsh marine environment. Annual visitation to this coastal Refuge currently exceeds 70,000 and is expanding. A wide variety of wildlife-dependent recreational and educational uses including all six priority public uses are ongoing on the Refuge: wildlife observation and photography, recreational fishing, waterfowl hunting, and environmental education and interpretation.	65	71	1	34
Anahuac NWR	Conduct baseline cultural resource survey	9	Conduct baseline cultural resource survey on Anahuac NWR. A formal inventory of Refuge cultural resources has not been completed. This coastal refuge's marshes and prairies were once inhabited by Atakapa and Karankawa Indians, and several shell middens along bayou and bay shorelines containing Paleo-Indian artifacts remain. Identification and cataloging of these sites are critical to their long-term protection.	65	0	0	35
McFaddin NWR	Protect Coastal Wetlands	1	Reduce wetland loss due to ongoing coastal erosion on McFaddin NWR. The Gulf shoreline along this Refuge is retreating at an average rate of 10-15 per year, resulting in 20 acres of wetland loss annually. Coastal scientists believe that the primary reason for this rapid rate of land loss is the loss of sediment input to the Gulf. Upstream dams and navigation jetties and channels prevent or restrict the transport of sediments which formerly fed shorelines in this coastal region. This project will restore the historic dune system along 14 miles of Refuge shoreline, slowing erosion and protecting refuge wetlands. Dune restoration will also benefit biological diversity. This project will expand an ongoing partnership with the Texas General Land Office and Texas A&M University.		135	0	1

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Improve Coastal Freshwater Wetlands Management	98004	Enhance coastal wetlands by restoring freshwater habitats on McFaddin NWR. Shallow freshwater wetlands along the Texas Gulf Coast have suffered the highest historical rate of wetland loss and continue to decline due to changing agricultural practices. Freshwater inflows to most of the Refuge were eliminated by construction of the Gulf Intracoastal Waterway. In periods of drought, surface freshwater is completely lacking. Five fresh water wells and related levees will be installed on the Refuge to provide habitat for migratory birds and resident wildlife, including nesting and brood-rearing areas for resident Mottled Ducks. Populations of this resident waterfowl species are declining in Texas. This coastal refuge hosts over 200,000 Central Flyway ducks and geese annually, and equally impressive numbers of shorebirds, wading birds, and neotropical songbirds.	140	11	0	2
McFaddin NWR	Control Invasive Exotic Species	2	Control invasive exotic plants on McFaddin and Texas Point NWRs. Coastal marshes, prairies and woodlots on these refuges provide vital wintering habitat for waterfowl, shorebirds, neotropical songbirds and raptors. Exotic plants impacting these refuges include water hyacinth, McCartney rose and Chinese tallow. Another new invasive plant, giant salvinia, occurs locally and threatens freshwater wetland habitats on McFaddin NWR. These fast growing exotics are highly invasive and out compete native plant species while providing little or no benefit to native wildlife. Invasion by exotic plants is a great threat to native biological diversity and ecosystem function on these refuges. Integrated pest management strategies, including herbicide application, water level and salinity manipulation, mechanical removal, burning and grazing will be used to help control these species.		26	0	3

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Enhance Coastal Wetlands Management	97004	Enhance wetlands management in the 5000-acre Wild Cow Bayou Marsh Unit. Unit is part of a large-scale hydrologic restoration project in the Salt Bayou watershed aimed at restoring and maintaining historic plant and animal communities associated with less saline coastal marsh types. Channelization of these marshes and elimination of freshwater inflows have increased saltwater intrusion, resulting in loss of emergent marshes through conversion to open water and a loss of overall biological diversity. Two water control structures will be installed for improved water level and salinity management. The refuge annually supports over 200,000 Central Flyway ducks and geese, and this unit is one the most productive on McFaddin NWR. High partnership potential with organizations such as Ducks Unlimited is expected.	119	10	0	4
McFaddin NWR	Protect refuge visitors and enhance resource protection	98007	Visitor safety and resource protection will be enhanced by establishing a refuge officer position for the McFaddin and Texas Point NWRs. Resource values are threatened by trespass, migratory bird violations, alligator poaching, and facilities by vandalism and theft. Much of these coastal Refuge are remote and accessible only by boat, posing dangers to recreational fisherman, boaters, and hunters and logistical difficulties for law enforcement activities. Enhancing the safety and quality of experience of its over 105,000 annual visitors and the protection of its natural and cultural resources are the focus of the Refuge Complex law enforcement program.	65	68	1	1

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Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Restore coastal wetlands through hydrologic restoration	16	Restore 1,200 acres of coastal marshes. Channels and ditches formerly used to access oil and gas developments are resulting in wetland loss and degradation on McFaddin NWR. Saltwater intrusion and erosion are converting productive and biologically diverse emergent marshes to open water. Several rock weirs will be installed in waterways on the Refuge to reduce these impacts and reverse these trends. These structures have proven highly effective and cost efficient for preventing wetland loss and degradation and promoting recovery of degraded marshes in coastal Louisiana. These structures also allow passage of juvenile fish and shellfish to and from marsh nursery habitats. This project has high partnership potential with the Texas General Land Office, conservation organizations, and volunteers.	85	0	0	2
McFaddin NWR	Restore and protect coastal wetlands	17	Restore and protect coastal marshes on McFaddin NWR by reducing erosion along the Gulf Intracoastal Waterway. Erosion along the GIWW is claiming wetlands and threatening over 80,000 acres on and adjacent to this coastal refuge. Saltwater intrusion and erosion are converting productive and biologically diverse emergent marshes to open water. A pilot project to reduce erosion along the GIWW will be implemented, using innovative techniques developed in Louisiana. Rock wave breaks have been installed, existing cutbanks sloped and erosion mats installed. This project will purchase and transplant smooth cordgrass to restore emergent marsh habitat and further protect the GIWW from erosion. Coastal marshes on the refuge provide vital habitat for wintering waterfowl of the Central Flyway, and recreational opportunities for over 30,000 people annually that come to waterfowl hunt, fish and observe wildlife. This project has high partnership potential with the Texas General Land Office.	50	0	0	3

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Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Provide vital operational support to refuge law enforcement program	5	Acquire needed equipment for law enforcement programs on McFaddin and Texas Point NWRs. These coastal refuges are remote and mostly accessible only by boat, posing dangers to recreational fisherman, boaters and hunters. Boats, airboats and specialized marsh vehicles are utilized by refuge staff conducting law enforcement activities. Resource values are threatened by trespass, migratory bird violations, alligator poaching, unauthorized cultural resource collection, and facilities by vandalism and theft. Equipment needs include: all-terrain vehicle and trailer; security system for refuge facilities; night surveillance equipment; gun safe; and boating supplies. The refuge law enforcement program focuses on safety and quality of experience of over 35,000 annual visitors and protection of natural and cultural resources.	22	8	0	4
McFaddin NWR	Control invasive plants in open water wetland habitats	2002	Control invasive plants in open water habitats on McFaddin and Texas Point NWRs. Native pest plants currently impacting these refuges include California bulrush and Roseau cane. Both of these plants tolerate a wide range of salinities and grow in wide range of water depth. Once established they eventually fill in open water ponds and waterways forming dense stands that provide little benefit to wildlife. Large areas that once provided important habitat for wintering waterfowl are now covered by thick stands of these plants. Invasion by native pest plants is a great threat to biological diversity and ecosystem function on these refuges. Integrated pest management strategies including herbicide application, mechanical removal, burning, and grazing will be used to help control these species. Coastal marshes and prairies on these refuges provide vital wintering habitat for waterfowl, shorebirds, neotropical songbirds, and raptors.	0	26	0	5

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Restore and enhance coastal woodlots and control exotics	3004	Restore and enhance 50 acres of coastal woodlots on the McFaddin and Texas Point NWRs. Development, sand and gravel mining, conversion to pasture and invasive species such as the exotic Chinese tallow have significantly impacted coastal woodlots in the Chenier Plain region of southwestern Louisiana and southeast Texas. This project involves Chinese tallow control, restoring natural hydrology, and purchase of trees and planting. Coastal woodlots provide vital migrational habitat for many neotropical songbirds, especially in spring when these habitats represent the first landfall for hundreds of thousands making nonstop flights across the Gulf of Mexico from Mexico's Yucatan Peninsula. Migratory songbirds utilize these wooded habitats for resting and foraging, to restore energy reserves prior to continuing their northward migration.	30	5	0	6
McFaddin NWR	Conduct long-term monitoring of fire effects in coastal wetlands and prairies	13	This 3-year study will determine soil, vegetation, and wildlife response to fire on McFaddin and Texas Point NWRs. Fire effects on marsh accretion rates will also be assessed. Although fire is a natural component of this coastal ecosystem, many ecological effects of fire in coastal wetland and prairie habitats remain poorly understood. Monitoring will be conducted to determine fire effects under differing burn frequencies and intensities, burn timing and among marsh types. Natural wildfire and prescribed burning are key components of the refuge's habitat management program, as fire is critical to maintaining native biological diversity and habitat values for migratory birds including waterfowl, raptors and songbirds. Fire is an important tool in control efforts for Chinese tallow, an exotic which provides few benefits for wildlife and reduces native biological diversity.	90	0	0	7

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Enhance refuge biological program	4	Acquire basic equipment and supplies needed to fully implement biological programs on McFaddin and Texas Point NWRs. Coastal ecosystems are highly complex and dynamic, and sound scientific data is needed to track changes in plant communities, trends in habitat quality and quantity, and fish and wildlife response to habitat changes. Equipment needs include spotting scopes and binoculars, GPS units, two lap top computers, surveying equipment, and bird banding supplies. These coastal refuges host over 200,000 Central Flyway ducks and geese annually, and provide vital habitat for other migratory birds including shorebirds, wading birds, songbirds and raptors. Listed species using the refuges include the endangered piping plover and brown pelican.	39	10	0	8
McFaddin NWR	Enhance grassland and wetland management through controlled grazing program	6	Improve grazing programs on McFaddin and Texas Point NWRs. Grazing is used to maintain grassland and wetland habitats on over 70,000 acres of the Texas Chenier Plain Refuge Complex. Needed improvements to ensure the continued compatibility of this management tool include revising rotational grazing units with new fencing and cattle guard installation, and improving water availability through development of water wells. Controlled grazing is a cost-efficient habitat management tool on these refuges which helps maintain quality habitat for wintering waterfowl, shorebirds and grassland songbirds. These refuges winter over 200,000 Central Flyway ducks and geese annually, and impressive numbers of shorebirds, wading birds and neotropical songbirds.	45	2	0	9

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Enhance controlled grazing program through habitat monitoring	9	Improve management of controlled grazing program. Information is needed to assess overall ecological effects of grazing to ensure a holistic management approach using this tool. Over 70,000 acres of the Texas Chenier Plain Refuge Complex are grazed on a rotational basis to maintain habitats in early successional stages favorable to many waterfowl species, to enhance and maintain plant diversity, to control exotic woody plants, and to enhance the vigor of grasslands. New and expanded surveys of plant community successional changes and wildlife response will be conducted. Wetlands and prairie on these coastal refuges support over two hundred thousand wintering ducks and geese annually, and equally impressive numbers of shorebirds, wading birds, neotropical migratory songbirds and raptors. Coastal marshes also serve as nursery habitat for many marine fish and shellfish species.	16	15	0	10
McFaddin NWR	Restore native prairie	3003	Enhance 100 acres of native prairie on the North Unit of McFaddin NWR and 15 acres on Texas Point NWR by sprigging native grasses and forbs. Native prairie plants will be purchased or salvaged and planted within existing stands of native prairie to increase the diversity of prairie plant communities on the refuges. Less than 1 percent of historical 9 million-acre coastal tallgrass prairie in Texas and Louisiana remains intact due to conversion to other land uses. This rare component of the western Gulf Coast coastal ecosystem supports wintering and breeding grassland songbirds, many species of which are in decline. This project will benefit several priority grassland species of concern including Henslow's sparrow, LeConte's sparrows, dickcissel, and Sprague's pipit, and well as other priority species including black rails and Mottled Ducks.	26	0	0	11

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Conduct neotropical migratory bird surveys	11	Conduct surveys of neotropical migratory birds in coastal wood lots, prairies, and marshes on McFaddin and Texas Point NWRs. These habitats provide important wintering and migrational habitats for neotropical migratory songbirds, shorebirds and wading birds. Several are listed species, or species of management concern, including Henslow's sparrow, piping plover, and reddish egret. Population and habitat use data is needed to maintain and manage public uses on the Refuge, including wildlife observation and environmental education, to ensure that these priority uses remain compatible. Improved biological data will also allow refinement of refuge habitat management activities aimed at benefiting these sensitive species. This monitoring effort supports the bi-national Gulf Crossings Project, a cooperative project between Mexico and the U.S.	36	5	0	12
McFaddin NWR	Conduct comprehensive alligator population survey utilizing DNA sampling	2001	Conduct a 5-year mitochondrial DNA study to improve estimates of alligator populations and improve tracking of alligator population trends. One egg from each alligator nest would be analyzed, and through DNA testing, the nesting female would be identified. By analyzing one egg from every nest for 5 years, the breeding population of alligators can be determined, and a population estimate derived through age-class distribution models. Accurate population estimates are needed to effectively manage alligator populations. Enhanced population data will be used to evaluate current management practices to ensure that they are consistent with maintaining a viable population of alligators. DNA analysis will be conducted by a university lab.	8.5	12	0	13

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Conduct American Bittern Study	3005	Conduct a 3-year study to determine habitat use and survival of American Bitterns in upper Texas coastal wetlands. Evaluate habitat preferences and characteristics, body condition and survival rates of American Bitterns using telemetry and banding. Birds will be captured, banded and radio collared with satellite transmitters. American Bittern populations are declining throughout most of their range, and this species has been identified as a priority waterbird in need of conservation action. Very little information is available on the wintering ecology of American Bitterns. Initial work on the refuge to compliment ongoing telemetry studies in breeding areas has documented the importance of the refuge to wintering American Bitterns. Researchers will also evaluate burning frequency and timing as related to American Bittern habitat selection and survival.	101	0	0	14
McFaddin NWR	Develop grit sites for Mottled Ducks	3002	Two grit sites will be developed in the Wild Cow Bayou Unit. Mottled duck populations are declining in Texas. Lead poisoning continues to negatively impact this species as demonstrated by high lead shot ingestion rates. Lead shot ingestion occurs primarily through foraging for grit, and natural grit is very scarce in most coastal marsh habitats in Texas. Two grit sites with appropriate sized grit will be established in the Wild Cow Bayou Unit, which provides key pair bonding, nesting and brood rearing habitat for Mottled Ducks. Providing grit may reduce the incidence of lead poisoning and will improve overall habitat conditions for this important resident waterfowl species.	29	0	0	15

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Enhance education and interpretive opportunities for refuge visitors	12	To maximize benefits to McFaddin and Texas Point NWR visitors, new informational brochures will be designed and produced. Nature tourism is expanding rapidly in the region and is becoming increasingly important to local and regional economies. These refuges play an important role in providing recreational and educational opportunities for the visiting public. Over 30,000 people visit McFaddin and Texas Point NWRs annually to fish, hunt, observe and photograph wildlife, and to participate in environmental education activities. The refuges are premier sites on the Great Texas Birding Trail. The refuge's general brochure and bird list will be revised to meet new USFWS standards, and new brochures for hunting, fishing, and flora and fauna lists will be developed and printed regularly to keep up with demand.	20	9	0	16
McFaddin NWR	Conduct baseline inventory of refuge amphibians and reptiles	7	Conduct an inventory of reptiles and amphibians on the McFaddin and Texas Point NWRs. Data on amphibians and reptiles, including species composition and relative abundance, are currently lacking for these coastal refuges. Threats to these sensitive species, which are often early indicators of declining ecosystem health, include loss of freshwater wetlands and contaminants (primarily agricultural pesticides). Species of concern include the smooth green snake, pig frog, and alligator snapping turtle. Enhanced biological data gained through systematic surveys will be used to evaluate population status of reptiles and amphibians occurring on the refuge, and to ensure that refuge management practices are consistent with maintaining viable population of these species.	48	0	0	17

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Enhance and expand recreational and educational opportunities	14	Develop environmental education and interpretation programs, a new Refuge Friends group, and enhance community outreach and law enforcement programs by establishing an entry level GS-5/7/9 Outdoor Recreation Planner position. This coastal Refuge is within two hours' drive of over 4 million people in the Houston Metroplex, resulting in high demand for recreational and educational opportunities. Annual visitation to this coastal refuge exceeds 30,000. Public uses occur year round and include wildlife observation, environmental education and interpretation, recreational fishing, and waterfowl hunting.	75	86	1	18
McFaddin NWR	Enhance and expand refuge habitat management program	18	Establish an entry level GS 5/7/9 Refuge Operations Specialist position to improve and expand habitat management activities in wetlands, resource protection through law enforcement, conservation easement monitoring, fire management, and overall administration of refuge public use programs. Habitats on these coastal refuges are intensively managed through water level management, prescribed burning, grazing and farming, and restoration of native grasslands and wetlands. Annual visitation to McFaddin and Texas Point NWRs exceeds 35,000 annually, for uses including hunting, fishing and wildlife observation. Over 8000 acres of conservation easements are administered. This trainee position will provide the incumbent with a full spectrum of refuge management and program administration experiences.	75	86	1	19

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
McFaddin NWR	Increase visitor services	15	Enhance visitor services by establishing a maintenance worker position to provide timely and improved maintenance of public use facilities on McFaddin and Texas Point NWRs. Facilities including observation platforms and boardwalks, trails, comfort stations, interpretive and directional signage, boat ramps, boundary signage and fencing require regular maintenance for protecting visitor safety and enhancing visitor experiences. Regular upkeep is necessitated by the harsh marine environment. Annual visitation to these coastal Refuges currently exceeds 35,000. A wide variety of wildlife-dependent recreational and educational uses including all six priority public uses are ongoing on the Refuges: wildlife observation and photography, recreational fishing, waterfowl hunting, environmental education and interpretation.	75	78	1	20
McFaddin NWR	Investigate McFaddin Beach Clovis Point cultural site	98001	The McFaddin Beach site is an important Clovis Point cultural site where human artifacts are found in association with Pleistocene fossils of extinct mammals, and is many thousands of years old. This site has yielded many excellent Clovis points to individual collectors over the past several decades, and is in need of investigation, documentation, and has exhibition potential. The proposed Highway 87 rebuilding effort would require a cultural investigation, as would the dune restoration project elsewhere identified as a RONS project. Currently, the cultural resources are being lost into the gulf via erosion and are being collected by unauthorized, illegal means.	205	116	1	21
McFaddin NWR	#NAME?	3006	This specific site is approximately one-half acre in size and is a Least Tern nesting area. In addition, it is known that the brine (waste) water from the production process was released on the site and has effectively destroyed the native vegetation and contaminated the topsoil resulting in sparse non-native vegetation establishment. The objectives of this project are: (1) remove the remaining machinery/equipment; and (2) reclaim the site with native vegetation. Reclamation of the site will require excavation of the contaminated soil, soil replacement and re-seeding of area.	83	5	0	999

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Texas Point NWR	Restore Coastal Wetland Habitats	1	Provide a heavy equipment operator position to restore coastal wetlands on Texas Point and McFaddin NWRs. Productive and biologically diverse emergent marshes on these refuge are converting to open water due to saltwater intrusion, erosion, and land subsidence. Restoration and protection of these coastal resources require intensive management, most of which requires the use of specialized heavy equipment. This individual will install and maintain water management infrastructure including rock weirs, water control structures and levees to help reverse this trend. Coastal marshes on these refuges support over 200,000 Central Flyway ducks and geese annually, and equally impressive numbers of shorebirds, wading birds, raptors, and songbirds. Tidally influenced marshes provide nursery habitat for juvenile fish and shellfish, and contribute to the local economy through recreational and commercial fishing.	65	68	1	1
Texas Point NWR	Restore Coastal Wetlands Through Hydrologic Restoration	2	Restore 2,500 acres of coastal marshes. Channels and ditches formerly used to access oil and gas developments are resulting in wetland loss and degradation on Texas Point NWR. Saltwater intrusion and erosion are converting productive and biologically diverse emergent marshes to open water. Several rock weirs will be installed in waterways on the Refuge to reduce these impacts and reverse these trends. These structures have proven highly effective and cost efficient for preventing wetland loss and degradation in Louisiana. These structures also allow passage of juvenile fish and shellfish to and from marsh nursery habitats. This project has high partnership potential with the Texas General Land Office, conservation organizations, and volunteers.	125	10	0	2

RONs Projects for Anahuac, McFaddin and Texas Point NWRs

Refuge	Project Title	RONs #	Project Description	Initial YR Cost (\$1,000s)	Recurring Cost (\$1,000s)	FTEs	Rank
Texas Point NWR	Restore Coastal Woodlots	95005	Restore and enhance 25 acres of coastal woodlots on Texas Point NWR. Development, sand and gravel mining, conversion to pasture and invasive species such as Chinese tallow have impacted coastal woodlots in the Chenier Plain region of southwestern Louisiana and southeast Texas. Coastal woodlots at the refuge will be restored and enhanced by control of exotic plants with approved herbicide treatment combined with planting native trees. Coastal woodlots provide vital migrational habitat for many songbirds, especially in spring when these woodlots represent the first landfall for hundreds of thousands of birds making nonstop flights across the Gulf of Mexico from Mexico's Yucatan Peninsula. Migratory songbirds use these wooded habitats for resting and foraging, to restore energy reserves prior to continuing their northward migration. These areas also provide spectacular recreational bird watching and provide great economic benefits to local communities through tourism.	28	7	0	3

CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126473	Construct an addition to the visitor contact station. \$277,000	Plan design and construct an addition to the visitor contact station to increase visitor services to the public. The small visitor contact station is not sufficient to provide services needed by the public. It does not have sufficient room to install interpretive displays, storage areas and sales area for the nature store. This facility is currently the only contact point the refuge has with the public. Visitor use on the refuge has increased by almost 10,000 visitors since the visitor information station was opened. Additional space is needed to develop adequate interpretive and informational displays to improve the quality of visitor experiences. This facility is within one hour drive of over 5 million people in the Houston and Beaumont, Texas Metroplex.
03126486	Construct a native prairie seed storage and drying facility. \$128,000	Construct a native prairie seed storage and drying facility to increase refuge capabilities to restore native coastal prairie. Wet humid and high rodent populations make it difficult to store native prairie seeds. Rot and rodent damage can significantly reduce the amount of useable prairie seed available for restoration. The refuges storage capabilities are restricted to ten 40 gallon drums and limit the amount of native prairie that can be planted each year. Seed that is harvested is very valuable for restoration purposes because of the rarity of the seed. It is critical that the valuable seed that is harvested is properly stored so new prairies can be created from the valuable prairies that remain. The facility will need electricity to operate dryers, ventilation and lights.
03126444	Construct water pipeline from County line to the refuge (Shop). \$221,000	Construct a water pipeline from the County (Trinity Bay Conservation District) pipeline located 6 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat during the summer makes it critical to have drinking water on the refuge for staff and visitors. The refuge currently purchases bottled water at great cost for the staff to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff and visitors.
03126445	Construct a water pipeline from the County pipeline. \$245,000	Construct a water pipeline from the County pipeline located 4 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat throughout the year make it critical to have drinking water on the refuge for staff, volunteers and visitors. The refuge currently purchases bottled water at great cost for the staff and volunteers to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff, volunteers and visitors.

CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126626	Large Rehabilitate East Bay bayou Tract roads and parking areas. \$403,000	Rehabilitate East Bay bayou Tract roads and parking areas to improve access and make roads safer for visitors. Expand the current one lane road to a two lane gravel road. Elevate and resurface parking areas and lower portions of road. Existing ditches and levees will need to be moved to facilitate road width expansion. The current road requires visitors to pull over on a very steep slope to allow cars to pass each other. Larger vehicles can not pull over far enough to allow opposing traffic to pass. This tract of the refuge facilitates tens of thousands visitors annually. It is within one hours drive of over five million people including Houston, Texas the fourth largest city in the nation. This project will require more than one year to design, plan and complete construction contracting.
03126558	Construct an observation tower on the East Bay Bayou Tract. \$113,000	Construct an accessible observation tower and photo blind at the East Bay Bayou Tract to improve visitors experiences. The tower would be constructed within the existing tree line at the canopy level. A photo blind would be constructed at the top of the tower to allow photographers to get pictures of migrant songbirds in the canopy of trees or wading birds, shorebirds or waterfowl in the adjacent moist soil units. The facility will be constructed so it is accessible to all refuge users. This unit is currently used by over ten thousand visitors annually. It is within one hours drive of over five million people including Houston, Texas the fourth largest city in the nation. Improvement of visitor facilities on this unit will attract thousands of new visitors to appreciate refuge resources. Planning, design and construction contracting can be accomplished in one year.
03126505	Construct boat ramp at refuge shop. \$89,000	Design and construct a new boat ramp and extend the existing boat canal at the refuge shop to allow staff to launch boats to conduct refuge management and law enforcement. Public boat ramps at the refuge are very limited in capacity for launching and parking. The extension of the boat canal and construction of a small boat but secure boat launch for refuge staff would reduce conflicts between staff and the public for limited space at the existing boat ramp. Construction would involve excavating a 200 x 25 foot canal with 4:1 slopes, pouring a 50 x 14 foot concrete pad, installation of a security light and fence on the boat canal. This development would improve law enforcement and refuge management efficiency and effectiveness. Boats are the primary tool used by refuge staff to manage and protect marsh habitats and wildlife. Electricity for lights would be necessary to facilitate night time launching. Planning, design and construction contracting could be completed in one year.
03126633	Construct kiosk and interpretive signs (East Bay Bayou Tract). \$27,000	Construct a kiosk and interpretive signs on the East Bay Bayou Tract to provide information about the refuge management. This unit serves a demonstration area to landowners, hunt clubs, outfitters and farmers. It also supports ten of thousand of visitors each year. Construction of an informational kiosk and installing five interpretive signs will improve visitors experiences on the unit. This unit is located within one hours drive of over five million people including Houston, Texas the fourth largest community in the nation. Planning, design and construction contracting can be accomplished in one year.

CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126636	Construct a new environmental education building. \$511,000	Construct a new environmental education building on the refuge to provide training facilities to areas schools and communities. Construct a 5000 square foot environmental education facility and install interpretive displays. This facility will be used to support the growing outdoor education program, Youth Waterfowl Expo programs and provide a meeting area on the refuge. Currently over one thousand school children attend environmental education programs on the refuge annually. Thousands of additional school children could attend these programs if indoor classrooms were available to provide a all weather training facility. Thousands of dollars are spent annually to rent tents for the refuge Youth Waterfowl Expo. This facility could provide classrooms for seminars for large events. Planning, design and construction can be accomplished in one year.
03126495	Construct a storage building for hurricane evacuation. \$369,000	Construct a storage building for storing equipment and files evacuated from the refuge during hurricanes and tropical storms. During tropical storms and hurricanes equipment, files and vehicles are relocated to higher areas protected from winds and water. The refuge currently does not have a storage building to relocate valuable files, electronics, airboats and other boats necessary to access the refuge during flooding events. Loss of information and tools could cripple the refuge for many years. Most of the refuge equipment can be stored in safe high locations on the refuge. The problem exists in getting back to protected areas on the refuge when roads are flooded. It is necessary to store boats and amphibious equipment to access the refuge at protected locations away from the refuge so that we have the ability to access the refuge during high water to protect resources from damage. Accessing the refuge with tradition vehicles during high water is dangerous and can damage equipment. Construction of a storage facility capable of storing two air boats, a jon boat, marsh buggy, files, generators and electronic equipment on an elevated site is needed. This facility will need electricity a back up generator system and a fuel storage area.
98123696	Construct trails, boardwalks and interpretive displays. \$216,000	Develop public use facilities on Anahuac NWR. This refuge is within one hour's drive of over 4 million people in the Houston Metroplex. Expanding annual visitation to this coastal refuge now exceeds 70,000, although public use facilities remain minimal. Information kiosks, interpretive and directional signs, observation platforms, boardwalks and trails will be installed to improve visitors experience. Public use on this Refuge includes all six of the priority uses - wildlife observation, environmental education and interpretation, recreational fishing, and waterfowl hunting. Based on the latest USFWS data available, the additional visitors to this area are expected to contribute \$51,026 annually to the local economy. All aspects of this project have high partnership potential with the Friends of Anahuac Refuge, industry, and volunteers.
03126549	Construct two new primitive boat ramps on the East Unit. \$72,000	Construct two primitive boat ramps on the East Unit to facilitate law enforcement and wetland management on the East side of the refuge. The County public boat launch was closed on the east side of the refuge in 2002. This public launch facilitated public and staff access to the east side of the refuge. It now requires at least a 14-20 mile boat ride to access eastern portions of the refuge. Two small
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CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126549 Cont.		concrete ramps would be installed. One on the Gulf Intracoastal waterway and the other Jackson Ditch. Tens of thousands of marsh on Anahuac and McFaddin refuge would become much more accessible for management and limited public access. Planning, design and construction contracting can be accomplished in one year.
98122763	Construct facility to increase volunteerism. \$224,000	Construct a building containing a meeting room, restroom, shower, and laundry facility next to existing volunteer RV sites. Funding will be used to purchase materials; supply electricity, water, and septic; provide facilities needed by volunteers. Purchase materials and appliances. Volunteers have become essential to refuge operations, contributing over 10,000 hours annually to various programs by conducting tours; coordinating the environmental education program; improving access for waterfowl hunters, anglers, and bird watchers; and assisting with habitat management and wildlife surveys. This project has high partnership potential with the Friends of Anahuac Refuge, and construction will be handled entirely by volunteers.
98122760	Construct 12-bay vehicle storage facility. \$214,000	This project involves the construction of a 12-bay vehicle storage facility for the Anahuac NWR and Texas Chenier Plain Refuge Complex vehicle and boat fleets. The refuge currently has limited covered storage for vehicles and boats. A storage building will protect vehicles and boats from corrosive damages from excessive exposure to sun, saltwater and occasional but regularly occurring flooding in low-lying coastal areas. Overall cost efficiency will be maximized by decreasing maintenance costs and increasing the equipment's working lifespan.
98122768	Construct boat ramp at refuge shop. \$40,000	Design and construct interpretive displays for placement in the Houston Intercontinental, Hobby, and Jefferson County airports, two major Interstate 10 rest areas in Chambers and Jefferson Counties, and a mobile display to be used in a variety of special events. Expanding nature tourism in the region and the ability to reach millions of people annually in the major population centers of Houston and Beaumont, Texas, provide an ideal setting for effective outreach. The materials would interpret Gulf Coast ecosystems and resources, and the region's national wildlife refuges and their management programs.
98110197	Rehabilitate levees on GIWW- Middleton. \$783,000	Rehab levees along the Gulf Intercoastal Water Way. The coastal wetlands on this portion of the refuge are currently threatened by GIWW erosion. These wetlands are among the most productive and diverse on the upper Texas Coast. Erosion along the GIWW has resulted significant erosion to the levees along the GIWW. Wetland loss, salt water intrusion and conversion of emergent marsh to open water has resulted in a loss of biological diversity and declining habitat quality for a variety of migratory birds. To reverse these trends, rehabilitation of levees along the GIWW is needed.
01110194 Cont. on next page	Office Building Replacement [p/d/cc] \$2,000,000	Plan, design and construct an Administrative Headquarters office for Texas Chenier Plain Refuge Complex. This four-refuge coastal Refuge Complex includes the Anahuac, McFaddin, Texas Point and Moody NWRs. The facility will greatly increase logistical capabilities for administering natural resource protection and public use programs by providing centrally-located office and meeting space for 18

CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
01110194 Cont.		permanent Refuge Complex and Anahuac NWR staff and seasonal staff and volunteers, and by providing secure parking and storage outside of flood-prone areas for vehicle and boat fleets. The existing 2,200 square foot headquarters building, leased through the General Services Administration, does not provide adequate office, storage, and meeting space and parking facilities. No suitable leasing alternatives exist in this rural area. Health and safety concerns in this forty-year old building include office overcrowding, pest problems, heating and cooling system and electrical deficiencies, and inadequate parking which requires on-street parking of private vehicles. Site development will include an access road, and vehicular parking for staff (20 spaces) and visitors (20 spaces). Additional secured parking for government vehicles (10 spaces) and a 4-bay storage building will also be developed. Water and septic will be needed on-site; telephone and electric service will be run from nearby utility lines. Planning, design, and construction contracting can be accomplished in one year.
97110195	Construct heavy equipment storage facility. \$865,000	Construct a new 6-bay, 3500 square foot equipment storage building (metal). Anahuac NWR is located in a low-lying coastal area which is subject to flooding during hurricane and tropical storm events. Storage facilities for equipment must either be located off-Refuge or raised to appropriate elevations using fill materials. Current storage facilities serving the Refuge are inadequate, and some equipment is regularly exposed to harsh marine climate. Land on high ground in High Island, Texas, currently proposed as a donation to the USFWS, would provide an ideal location for this facility.
98110196	Construct an access road along the Gulf Intracoastal Waterway. \$1017,000	This project involves two options for providing public and management access to the newly acquired Middleton Tract of Anahuac NWR: 1) the construction of an access road along the Gulf Intracoastal Waterway to East Bay Bayou from State Highway 124; or 2) the construction of a bridge across East Bay Bayou and a road to connect with the existing access road on the East Unit. This tract requires management access to facilitate habitat management activities including water management and prescribed burning. Public access is needed to support compatible wildlife-dependent uses including waterfowl hunting and wildlife viewing.
98110198	Construct three single-family residence. \$703,000	Construct three single-family residence. Off-refuge housing is limited. Refuge law enforcement and public use personnel would be much more effective if they resided on-station. This project involves the construction of three single-family homes to provide refuge housing for Anahuac NWR staff.
2005168461	Replace otter slough water control Structure	
2005178666	Rehabilitate East Bay Bayou Levee	Clean, slope and elevate East Bay Bayou levee on the East Bay Bayou Unit of the East Unit Tract. Protect and bulkhead the East Bay Bayou saltwater barrier. This levee system protects and facilitates management of over 4,100 acre or fresh & intermediate marsh on the refuge and the attached salt water barrier protects 1000's of acres of private land from saltwater intrusion. Significant erosion from tropical storms Allison in 2001 has eroded around the saltwater barrier & has reduced the elevation of the levee.

CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
2005191191	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp.	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp to improve accessibility. The current launch will be expanded and improved to allow two boats to be launched at the same time, install a solar powered light, and modify the dock to make it accessible in variable tide conditions. The current launch is not lighted and visitors have damaged supports while launching at night.
2006331801	Construct boat ramp at refuge shop. \$89,000	Design and construct a new boat ramp and extend the existing boat canal at the refuge shop to allow staff to launch boats to conduct refuge management and law enforcement. Public boat ramps at the refuge are very limited in capacity for launching and parking. The extension of the boat canal and construction of a small boat but secure boat launch for refuge staff would reduce conflicts between staff and the public for limited space at the existing boat ramp. Construction would involve excavating a 200 x 25 foot canal with 4:1 slopes, pouring a 50 x 14 foot concrete pad, installation of a security light and fence on the boat canal. This development would improve law enforcement and refuge management efficiency and effectiveness. Boats are the primary tool used by refuge staff to manage and protect marsh habitats and wildlife. Electricity for lights would be necessary to facilitate night time launching. Planning, design and construction contracting could be completed in one year.
2006331795	Construct boat ramp at refuge shop. \$40,000	Design and construct interpretive displays for placement in the Houston Intercontinental, Hobby, and Jefferson County airports, two major Interstate 10 rest areas in Chambers and Jefferson Counties, and a mobile display to be used in a variety of special events. Expanding nature tourism in the region and the ability to reach millions of people annually in the major population centers of Houston and Beaumont, Texas, provide an ideal setting for effective outreach. The materials would interpret Gulf Coast ecosystems and resources, and the region's national wildlife refuges and their management programs.
2006331800	Construct trails, boardwalks and interpretive displays. \$216,000	Develop public use facilities on Anahuac NWR. This refuge is within one hour's drive of over 4 million people in the Houston Metroplex. Expanding annual visitation to this coastal refuge now exceeds 70,000, although public use facilities remain minimal. Information kiosks, interpretive and directional signs, observation platforms, boardwalks and trails will be installed to improve visitors experience. Public use on this Refuge includes all six of the priority uses - wildlife observation, environmental education and interpretation, recreational fishing, and waterfowl hunting. Based on the latest USFWS data available, the additional visitors to this area are expected to contribute \$51,026 annually to the local economy. All aspects of this project have high partnership potential with the Friends of Anahuac Refuge, industry, and volunteers.
2005238569 Cont. on next page	Repair or replace boat rollers on the Middleton Tract. \$27,000	Repair or replace boat rollers on the Middleton Tract to facilitate boat access into hunt units of the refuge. Boat rollers provide access to hunters over levees into waterfowl hunt units of the refuge. Boat rollers facilitate almost a one thousand use days for refuge hunters. Wooden supports galvanized and pvc rollers need to be replaced. The existing rollers need to be extended and winch posts need to be

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Work Order #	Project Title and Cost	Project Description
2005238569 Cont.		installed to facilitate access during low tide events. Planning, design and construction contracting can be accomplished in one year.
2006332625	Construct kiosk and interpretive signs (East Bay Bayou Tract). \$27,000	Construct a kiosk and interpretive signs on the East Bay Bayou Tract to provide information about the refuge management. This unit serves a demonstration area to landowners, hunt clubs, outfitters and farmers. It also supports ten of thousand of visitors each year. Construction of an informational kiosk and installing five interpretive signs will improve visitors experiences on the unit. This unit is located within one hours drive of over five million people including Houston, Texas the fourth largest community in the nation. Planning, design and construction contracting can be accomplished in one year.
2006332344	Construct two new primitive boat ramps on the East Unit. \$72,000	Construct two primitive boat ramps on the East Unit to facilitate law enforcement and wetland management on the East side of the refuge. The County public boat launch was closed on the east side of the refuge in 2002. This public launch facilitated public and staff access to the east side of the refuge. It now requires at least a 14-20 mile boat ride to access eastern portions of the refuge. Two small concrete ramps would be installed. One on the Gulf Intracoastal waterway and the other Jackson Ditch. Tens of thousands of marsh on Anahuac and McFaddin refuge would become much more accessible for management and limited public access. Planning, design and construction contracting can be accomplished in one year.
2006332569	Construct an observation tower on the East Bay Bayou Tract. \$113,000	Construct an accessible observation tower and photo blind at the East Bay Bayou Tract to improve visitors experiences. The tower would be constructed within the existing tree line at the canopy level. A photo blind would be constructed at the top of the tower to allow photographers to get pictures of migrant songbirds in the canopy of trees or wading birds, shorebirds or waterfowl in the adjacent moist soil units. The facility will be constructed so it is accessible to all refuge users. This unit is currently used by over ten thousand visitors annually. It is within one hours drive of over five million people including Houston, Texas the fourth largest city in the nation. Improvement of visitor facilities on this unit will attract thousands of new visitors to appreciate refuge resources. Planning, design and construction contracting can be accomplished in one year.
2006506144	Rehabilitate the tan equipment storage building (Red Wolf). \$115,000	Rehabilitate the tan (Red Wolf) equipment storage building to protect refuge equipment. Portion of the existing floor needs to be covered with concrete, additional lighting is needed, several doors need to be repaired to properly secure the building and make it safe for staff entry during night time hours. Industrial shelving is needed to protect and properly store specific refuge equipment.
2006506118 Cont. on next page	Rehabilitate boat canal banks with shoreline protection. \$429,000	Rehabilitate the boat canal banks with shoreline protection. The boat canal banks have experience significant erosion from boat wakes. Erosion has increased the size of the boat canal by five feet. The banks are threatening to erode into the adjacent property owners land. Canal banks will be sloped and

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Work Order #	Project Title and Cost	Project Description
2006506118 Cont.		armored with cable block and felt. This canal provides boat access to refuge and state waters for tens of thousands of fisherman, hunters and nature enthusiast annually.
2006506099	Construct a new environmental education building. \$511,000	Construct a new environmental education building on the refuge to provide training facilities to areas schools and communities. Construct a 5000 square foot environmental education facility and install interpretive displays. This facility will be used to support the growing outdoor education program, Youth Waterfowl Expo programs and provide a meeting area on the refuge. Currently over one thousand school children attend environmental education programs on the refuge annually. Thousands of additional school children could attend these programs if indoor classrooms were available to provide a all weather training facility. Thousands of dollars are spent annually to rent tents for the refuge Youth Waterfowl Expo. This facility could provide classrooms for seminars for large events. Planning, design and construction can be accomplished in one year.
2006506222	Construct a native prairie seed storage and drying facility. \$128,000	Construct a native prairie seed storage and drying facility to increase refuge capabilities to restore native coastal prairie. Wet humid and high rodent populations make it difficult to store native prairie seeds. Rot and rodent damage can significantly reduce the amount of useable prairie seed available for restoration. The refuges storage capabilities are restricted to ten 40 gallon drums and limit the amount of native prairie that can be planted each year. Seed that is harvested is very valuable for restoration purposes because of the rarity of the seed. It is critical that the valuable seed that is harvested is properly stored so new prairies can be created from the valuable prairies that remain. The facility will need electricity to operate dryers, ventilation and lights.
2006506224	Construct a native prairie seed storage and drying facility. \$128,000	Construct a native prairie seed storage and drying facility to increase refuge capabilities to restore native coastal prairie. Wet humid and high rodent populations make it difficult to store native prairie seeds. Rot and rodent damage can significantly reduce the amount of useable prairie seed available for restoration. The refuges storage capabilities are restricted to ten 40 gallon drums and limit the amount of native prairie that can be planted each year. Seed that is harvested is very valuable for restoration purposes because of the rarity of the seed. It is critical that the valuable seed that is harvested is properly stored so new prairies can be created from the valuable prairies that remain. The facility will need electricity to operate dryers, ventilation and lights.
2006508106	Windmill Rd & parking (Rte 11, 6.7 mi) \$ 2382,000	Construction. Repair 9 miles of roads and parking areas in the Old Anahuac Unit from the shop to Frozen Point (Windmill Road). Project will include restoring and crowning roadbeds, regraveling and cleaning road ditches. These roads provide recreational opportunities for over 60,000 visitors annually and provide the only public access to the north side of East Galveston Bay.

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Work Order #	Project Title and Cost	Project Description
2006508109	Windmill Rd & parking (Rte 11, 6.7 mi) \$ 2382,000	Construction. Repair 9 miles of roads and parking areas in the Old Anahuac Unit from the shop to Frozen Point (Windmill Road). Project will include restoring and crowning roadbeds, regravelling and cleaning road ditches. These roads provide recreational opportunities for over 60,000 visitors annually and provide the only public access to the north side of East Galveston Bay.
2006506232	Rehabilitate East Bay Bayou walking trail. \$68,000	Rehabilitate the East Bay Bayou walking trail to improve visitor use and experiences. Improvements of this trail are sure to allow more visitors to appreciate wildlife resources on the refuge. The existing trail system needs to be crowned and resurfaced with rock to improve walking conditions. Existing culverts need to be replaced and additional culverts installed to reduce flooding, erosion and the tripping hazards along portions of the trail. Directional and interpretive signs will be installed to direct visitors along the trail.
2006506240	Construct a storage building for hurricane evacuation. \$369,000	Construct a storage building for storing equipment and files evacuated from the refuge during hurricanes and tropical storms. During tropical storms and hurricanes equipment, files and vehicles are relocated to higher areas protected from winds and water. The refuge currently does not have a storage building to relocate valuable files, electronics, airboats and other boats necessary to access the refuge during flooding events. Loss of information and tools could cripple the refuge for many years. Most of the refuge equipment can be stored in safe high locations on the refuge. The problem exists in getting back to protected areas on the refuge when roads are flooded. It is necessary to store boats and amphibious equipment to access the refuge at protected locations away from the refuge so that we have the ability to access the refuge during high water to protect resources from damage. Accessing the refuge with tradition vehicles during high water is dangerous and can damage equipment. Construction of a storage facility capable of storing two air boats, a jon boat, marsh buggy, files, generators and electronic equipment on an elevated site is needed. This facility will need electricity a back up generator system and a fuel storage area.
2006507534	Construct an access road along the Gulf Intracoastal Waterway. \$1017,000	This project involves two options for providing public and management access to the newly acquired Middleton Tract of Anahuac NWR: 1)the construction of an access road along the Gulf Intracoastal Waterway to East Bay Bayou from State Highway 124; or 2) the construction of a bridge across East Bay Bayou and a road to connect with the existing access road on the East Unit. This tract requires management access to facilitate habitat management activities including water management and prescribed burning. Public access is needed to support compatible wildlife-dependent uses including waterfowl hunting and wildlife viewing.
2006506242	Construct a storage building for hurricane evacuation. \$369,000	Construct a storage building for storing equipment and files evacuated from the refuge during hurricanes and tropical storms. During tropical storms and hurricanes equipment, files and vehicles are relocated to higher areas protected from winds and water. The refuge currently does not have a storage building to relocate valuable files, electronics, airboats and other boats necessary to access the refuge during

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CONSTRUCTION MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
2006506242 Cont.		flooding events. Loss of information and tools could cripple the refuge for many years. Most of the refuge equipment can be stored in safe high locations on the refuge. The problem exists in getting back to protected areas on the refuge when roads are flooded. It is necessary to store boats and amphibious equipment to access the refuge at protected locations away from the refuge so that we have the ability to access the refuge during high water to protect resources from damage. Accessing the refuge with tradition vehicles during high water is dangerous and can damage equipment. Construction of a storage facility capable of storing two air boats, a jon boat, marsh buggy, files, generators and electronic equipment on an elevated site is needed. This facility will need electricity a back up generator system and a fuel storage area.
2006506254	Replace the New Ditch water control structure. \$144,000	Replace the New Ditch water control structure and bulkheads. The current structure is insufficient for the water shed that it supports. This structure makes it possible to manage water levels, salinities and water quality in 6,500 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. The structure will be relocated and replaced with a larger aluminum box culvert with vinyl bulkheads. Planning and design is underway and the construction can be completed in one year.
2006506261	Construct an addition to the visitor contact station. \$277,000	Plan design and construct an addition to the visitor contact station to increase visitor services to the public. The small visitor contact station is not sufficient to provide services needed by the public. It does not have sufficient room to install interpretive displays, storage areas and sales area for the nature store. This facility is currently the only contact point the refuge has with the public. Visitor use on the refuge has increased by almost 10,000 visitors since the visitor information station was opened. Additional space is needed to develop adequate interpretive and informational displays to improve the quality of visitor experiences. This facility is within one hour drive of over 5 million people in the Houston and Beaumont, Texas Metroplex.
2006506265	Construct an addition to the visitor contact station. \$277,000	Plan design and construct an addition to the visitor contact station to increase visitor services to the public. The small visitor contact station is not sufficient to provide services needed by the public. It does not have sufficient room to install interpretive displays, storage areas and sales area for the nature store. This facility is currently the only contact point the refuge has with the public. Visitor use on the refuge has increased by almost 10,000 visitors since the visitor information station was opened. Additional space is needed to develop adequate interpretive and informational displays to improve the quality of visitor experiences. This facility is within one hour drive of over 5 million people in the Houston and Beaumont, Texas Metroplex.

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Work Order #	Project Title and Cost	Project Description
2006506641	Rehabilitate levees on GIWW- Middleton. \$783,000	Rehab levees along the Gulf Intercoastal Water Way. The coastal wetlands on this portion of the refuge are currently threatened by GIWW erosion. These wetlands are among the most productive and diverse on the upper Texas Coast. Erosion along the GIWW has resulted significant erosion to the levees along the GIWW. Wetland loss, salt water intrusion and conversion of emergent marsh to open water has resulted in a loss of biological diversity and declining habitat quality for a variety of migratory birds. To reverse these trends, rehabilitation of levees along the GIWW is needed.
2006506287	Construct water pipeline from County line to the refuge (Shop). \$221,000	Construct a water pipeline from the County (Trinity Bay Conservation District) pipeline located 6 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat during the summer makes it critical to have drinking water on the refuge for staff and visitors. The refuge currently purchases bottled water at great cost for the staff to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff and visitors.
2006506100	Construct a new environmental education building. \$511,000	Construct a new environmental education building on the refuge to provide training facilities to areas schools and communities. Construct a 5000 square foot environmental education facility and install interpretive displays. This facility will be used to support the growing outdoor education program, Youth Waterfowl Expo programs and provide a meeting area on the refuge. Currently over one thousand school children attend environmental education programs on the refuge annually. Thousands of additional school children could attend these programs if indoor classrooms were available to provide a all weather training facility. Thousands of dollars are spent annually to rent tents for the refuge Youth Waterfowl Expo. This facility could provide classrooms for seminars for large events. Planning, design and construction can be accomplished in one year.
2006508000	CN Oyster Bayou Rd (Rte 103, 2.1 mi) \$1094,000	Construction. Rebuild and regravell 4 miles of Oyster Bayou Road. This road is currently closed to the public due to its deteriorated condition. Reopening this road will provide recreational opportunities for over 20,000 visitors annually.
2006507995	CN Oyster Bayou Rd (Rte 103, 2.1 mi) \$1094,000	Construction. Rebuild and regravell 4 miles of Oyster Bayou Road. This road is currently closed to the public due to its deteriorated condition. Reopening this road will provide recreational opportunities for over 20,000 visitors annually.
2006507463	Office Building Replacement [p/d/cc] \$2,000,000	Plan, design and construct an Administrative Headquarters office for Texas Chenier Plain Refuge Complex. This four-refuge coastal Refuge Complex includes the Anahuac, McFaddin, Texas Point and Moody NWRs. The facility will greatly increase logistical capabilities for administering natural resource protection and public use programs by providing centrally-located office and meeting space for 18 permanent Refuge Complex and Anahuac NWR staff and seasonal staff and volunteers, and by providing secure parking and storage outside of flood-prone areas for vehicle and boat fleets. The

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Work Order #	Project Title and Cost	Project Description
2006507463 Cont.		existing 2,200 square foot headquarters building, leased through the General Services Administration, does not provide adequate office, storage, and meeting space and parking facilities. No suitable leasing alternatives exist in this rural area. Health and safety concerns in this forty-year old building include office overcrowding, pest problems, heating and cooling system and electrical deficiencies, and inadequate parking which requires on-street parking of private vehicles. Site development will include an access road, and vehicular parking for staff (20 spaces) and visitors (20 spaces). Additional secured parking for government vehicles (10 spaces) and a 4-bay storage building will also be developed. Water and septic will be needed on-site; telephone and electric service will be run from nearby utility lines. Planning, design, and construction contracting can be accomplished in one year.
2006507467	Office Building Replacement [p/d/cc] \$2,000,000	Plan, design and construct an Administrative Headquarters office for Texas Chenier Plain Refuge Complex. This four-refuge coastal Refuge Complex includes the Anahuac, McFaddin, Texas Point and Moody NWRs. The facility will greatly increase logistical capabilities for administering natural resource protection and public use programs by providing centrally-located office and meeting space for 18 permanent Refuge Complex and Anahuac NWR staff and seasonal staff and volunteers, and by providing secure parking and storage outside of flood-prone areas for vehicle and boat fleets. The existing 2,200 square foot headquarters building, leased through the General Services Administration, does not provide adequate office, storage, and meeting space and parking facilities. No suitable leasing alternatives exist in this rural area. Health and safety concerns in this forty-year old building include office overcrowding, pest problems, heating and cooling system and electrical deficiencies, and inadequate parking which requires on-street parking of private vehicles. Site development will include an access road, and vehicular parking for staff (20 spaces) and visitors (20 spaces). Additional secured parking for government vehicles (10 spaces) and a 4-bay storage building will also be developed. Water and septic will be needed on-site; telephone and electric service will be run from nearby utility lines. Planning, design, and construction contracting can be accomplished in one year.
2006507478	Construct heavy equipment storage facility. \$865,000	Construct a new 6-bay, 3500 square foot equipment storage building (metal). Anahuac NWR is located in a low-lying coastal area which is subject to flooding during hurricane and tropical storm events. Storage facilities for equipment must either be located off-Refuge or raised to appropriate elevations using fill materials. Current storage facilities serving the Refuge are inadequate, and some equipment is regularly exposed to harsh marine climate. Land on high ground in High Island, Texas, currently proposed as a donation to the USFWS, would provide an ideal location for this facility.
2006507539 Cont. on next page	Construct an access road along the Gulf Intracoastal Waterway. \$1017,000	This project involves two options for providing public and management access to the newly acquired Middleton Tract of Anahuac NWR: 1) the construction of an access road along the Gulf Intracoastal Waterway to East Bay Bayou from State Highway 124; or 2) the construction of a bridge across East Bay Bayou and a road to connect with the existing access road on the East Unit. This tract requires management access to facilitate habitat management activities including water management and

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Work Order #	Project Title and Cost	Project Description
2006507539 Cont.		prescribed burning. Public access is needed to support compatible wildlife-dependent uses including waterfowl hunting and wildlife viewing.
2006508165	Remove old levees and rehab main levee in Granberry Tract. \$167,000	Grub and remove old levees on the west side of the Granberry tract. Rehab bottom levee by removing brush, elevating, grading, sloping and install 3 new water control structures. This project will remove 10,500 of unused levees. The proposed project will facilitate restoration of 205 acres of native coastal prairie and shallow fresh water wetlands in the unit. Planning, design and construction can be accomplished in one year.
2006506639	Rehabilitate levees on GIWW- Middleton. \$783,000	Rehab levees along the Gulf Intercoastal Water Way. The coastal wetlands on this portion of the refuge are currently threatened by GIWW erosion. These wetlands are among the most productive and diverse on the upper Texas Coast. Erosion along the GIWW has resulted significant erosion to the levees along the GIWW. Wetland loss, salt water intrusion and conversion of emergent marsh to open water has resulted in a loss of biological diversity and declining habitat quality for a variety of migratory birds. To reverse these trends, rehabilitation of levees along the GIWW is needed.
2006507397	Repair East Unit farm roads. \$1191,000	Repair East Unit farm roads by restoring and crowning roadbed and cleaning road ditches. These roads provide access for rice farming and moist soil management, two practices aimed at providing high quality habitat for wintering waterfowl and for public waterfowl hunting. Maintenance will increase the longevity of these roads, and provide cost-savings by preventing the need for major repairs.
2006506295	Construct water pipeline from County line to the refuge (Shop). \$221,000	Construct a water pipeline from the County (Trinity Bay Conservation District) pipeline located 6 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat during the summer makes it critical to have drinking water on the refuge for staff and visitors. The refuge currently purchases bottled water at great cost for the staff to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff and visitors.
2006506301	Construct a water pipeline from the County pipeline. \$245,000	Construct a water pipeline from the County pipeline located 4 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat throughout the year make it critical to have drinking water on the refuge for staff, volunteers and visitors. The refuge currently purchases bottled water at great cost for the staff and volunteers to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff, volunteers and visitors.

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Work Order #	Project Title and Cost	Project Description
2006506302	Construct a water pipeline from the County pipeline. \$245,000	Construct a water pipeline from the County pipeline located 4 miles from the refuge to the refuge shop. The refuge currently does not have a drinking water system. The remote location of the refuge and extreme heat throughout the year make it critical to have drinking water on the refuge for staff, volunteers and visitors. The refuge currently purchases bottled water at great cost for the staff and volunteers to drink. The public has no access to water except in emergencies. Connecting the refuge with the county water system will eliminate the need for the current shop well and pumping system and the purchase of bottled water. It will also provide critically needed drinking water to staff, volunteers and visitors.
2006519168	Construct facility to increase volunteerism. \$224,000	Construct a building containing a meeting room, restroom, shower, and laundry facility next to existing volunteer RV sites. Funding will be used to purchase materials; supply electricity, water, and septic; provide facilities needed by volunteers. Purchase materials and appliances. Volunteers have become essential to refuge operations, contributing over 10,000 hours annually to various programs by conducting tours; coordinating the environmental education program; improving access for waterfowl hunters, anglers, and bird watchers; and assisting with habitat management and wildlife surveys. This project has high partnership potential with the Friends of Anahuac Refuge, and construction will be handled entirely by volunteers.
2006519129	Construct 12-bay vehicle storage facility. \$214,000	This project involves the construction of a 12-bay vehicle storage facility for the Anahuac NWR and Texas Chenier Plain Refuge Complex vehicle and boat fleets. The refuge currently has limited covered storage for vehicles and boats. A storage building will protect vehicles and boats from corrosive damages from excessive exposure to sun, saltwater and occasional but regularly occurring flooding in low-lying coastal areas. Overall cost efficiency will be maximized by decreasing maintenance costs and increasing the equipment's working lifespan.
2006534275	Rehabilitate Elm and East Bay Bayou Levees. \$478,000	Rehabilitate Elm and East Bay Bayou Levees (Middleton). Clear, slope and elevate levees on Elm and East Bay Bayou on the Middleton Tract. Protect and bulkhead the saltwater barrier attached to the Elm Bayou levee. This levee system protects and facilitates the management of over 3,500 acres of fresh and intermediate marsh on the refuge and protects 1000s of acres of private land from salt water intrusion. Significant erosion occurred near the salt water barrier and reduced the elevation in key areas of the levee.

CONSTRUCTION MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
03126647	Construct new Water Control Structure at O-Ditch and GIWW. \$153,000	Plan, design, and construct a new water control structure on O-Ditch at the Intracoastal Waterway, to improve our water management capabilities in the 8,000-acre Wild Cow Bayou Unit. Man-made changes off refuge in the watershed have increased drainage time in this unit which has adversely affected the health of the marsh. This structure would allow us to more effectively manage water by releasing it at the top of the watershed during extreme high water conditions. Structure would be a forty-foot long, 60" pipe with concrete headers, a flap-gate at the outfall, a screwgate, and a half-round riser on the inside. Planning, design, and construction contracting can be accomplished in one year.
03126651	Construct new Water Control Structure at Willow Lake Outfall Ditch and GIWW. \$153,000	Plan, design, and construct a water control structure on the Willow Lake outfall Ditch at the Intracoastal Waterway to improve our water management capabilities in the 8,000-acre Wild Cow Bayou Unit. Man-made changes off refuge in the watershed have increased drainage time in this unit which has adversely affected the health of the marsh. This structure would allow us to more effectively manage water by releasing it at the top of the watershed during extreme high water conditions. Structure would be forty-foot long, 60" pipe with concrete headers, a flap-gate at the outfall, a screwgate, and a half-round riser on the inside. Planning, design, and construction contracting can be accomplished in one year.
00123697	Construct Fishing piers, boat docks and ramps, parking areas and waterway access. \$181,000	Improve access and enhance opportunities for public waterfowl hunting and fishing on McFaddin NWR. Facilities which improve access for public recreation are a critical need to support this Refuge's growing public use program. Fishing piers, boat docks and ramps, parking areas and waterway access will be developed to support these popular activities. Families visit this coastal refuge daily to enjoy excellent recreational fishing and crabbing, and the Refuge also hosts the largest public waterfowl hunt in Texas, serving over 6,000 hunters annually. This project has high partnership potential with local outdoor organizations and volunteers. Based on the latest Fish and Wildlife Service data available, the additional visitors are expected to contribute \$91,698 to the local economy.
00122722	Develop interpretive and wildlife observation facilities. \$130,000	Enhance visitor services on McFaddin NWR by developing interpretive and wildlife observation facilities. Nature tourism is expanding rapidly on the Texas Gulf Coast, and although this coastal refuge provides great opportunities for wildlife observation and nature interpretation, facilities are minimal. Public use occurs year-round and includes all six priority uses - wildlife observation and photography, fishing, waterfowl hunting, environmental education and interpretation. The Refuge is a prime site on the Great Texas Birding Trail. To commemorate the Refuge System Centennial, facilities including a kiosk with interpretive panels, observation platforms, and boardwalks will be developed. All aspects of this project have high partnership potential with conservation organizations, industry and local agencies.
R3117106 Cont. on next page	Bridge Rehabilitation/Replacement [p/d/cc]. \$1013,000	This project includes the planning, design, and construction to replace one bridge and rehabilitate a second bridge at McFaddin NWR. Currently, the condition of both bridges represents a significant safety hazard. Specifically, the Ten-Mile Cut Bridge will be replaced and the Star Lake Corps Structure Bridge will be rehabilitated to include safety features and guardrails. The Ten-Mile Cut Bridge is deteriorated

CONSTRUCTION MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
R3117106 Cont.		and worn to the point that rehabilitation is not an option as the wood supports are rotted and deteriorated. The Star Lake Corps Structure Bridge is hazardous to users because of the structural and safety deficiencies including deteriorated substructures and bridge decks, and nonexistent or inadequate guardrails and signs.
95110199	Construct new administrative facility for McFaddin/Texas Point NWRs. \$920,000	Construct a new administrative office facility for McFaddin/Texas Point NWR staff. This 3,500 square foot facility will house the 10 person refuge staff, and contain a 400 square foot area for providing visitor services and information. Electrical, telephone and water utilities will be provided through adjacent city utility lines; septic will have to be developed on-site. Current administrative is a very old retrofitted hunting club. The building is greater than 50 years old and falling apart. This new building will negate health and safety hazards posed by the current facility and meet required Refuge operational goals and objectives.
00110200	Construct three residences to house refuge staff. \$2088,000	Construct three residences to house refuge staff of McFaddin and Texas Point NWRs. These three bedroom, double garage residences will house refuge management and biological staff. Likely location for the residences is within the community of Sabine Pass, adjacent to Texas Point NWR. Electrical, water, and telephone service is available from existing utility infrastructure along State Highway 87; septic systems will have to be developed on-site. There is only one residence currently located on McFaddin National Wildlife Refuge. The closest (12 miles) town is Sabine Pass, which is very small and does not offer real estate opportunities. The next closest (25 miles) town to the Refuge is Port Arthur. Due to the distance from the Refuge to the closest place for employees to live, many individuals will not seek employment at McFaddin National Wildlife Refuge. Construction on Refuge residences will facilitate staffing and recruitment opportunities for McFaddin and Texas Point National Wildlife Refuges.
2005170812	Repair eroded segment of South GIWW Levee East	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the Star Lake Road Stretch. Wakes from large barges and other water craft have undercut and eroded most of the levee and threatens the road. This project will protect the refuge's Five Mile Cut Unit which would degrade this area's freshwater wetland habitat. This project would also protect the only access road to the most heavily used unit by the public. This unit has about 4,000 acres of wetlands, and supports over 100,000 wintering waterfowl annually.
2005180373	Repair the central section of GIWW levee on the North Unit	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the North Unit. Wakes from large barges and other water craft have caused the bank to be undercut and erode away most of the levee. This project will protect the refuge's North Unit from saltwater intrusion which would degrade this area's freshwater marsh. This unit contains 8,000 acres supporting over 100,000 wintering waterfowl annually.
2005190393 Cont. on next page	Repair North Unit's GIWW levee, west 1 mile section	Repair North Unit's levee, west 1 mile section. Stabilize and armor highly eroded earthen Gulf Intracoastal Waterway levee along the North Unit. Waves from large barges and other water craft have caused banks to be undercut and erode most of the levee. This project will protect the refuge's north unit

CONSTRUCTION MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
2005190393 Cont.		from saltwater intrusion, which would degrade this area's fresh marshes. This unit contains over 8,000 acres supporting over 100,000 wintering waterfowl and other species of concern.
2005240832	Rehabilitate LeBlanc's Reservoir levees. \$221,000	Rehabilitate LeBlanc's Reservoir levees. These levees have eroded from storms, flooding, and damage from alligators. The levees are breached in numerous places and water management capabilities have been lost. As a result, high quality aquatic plant production has been lost, resulting in a reduction in the availability of quality wintering habitat for numerous waterfowl and wading birds. This project will reestablish levees of this freshwater impoundment which will allow salinity levels to be reduced.
2005240881	Replace boundary fence on western units of McFaddin NWR. \$156,000	Replace 3 miles of refuge boundary fence on western units of McFaddin NWR. Existing fences have been damaged during storms and through vandalism, and are subject to a corrosive environment. These fences mark the refuge boundaries, control trespass and damage of sensitive habitats, and designate pastures used in the refuge's rotational grazing program. Project includes signing and surveying where needed.
2005267329	Develop interpretive and wildlife observation facilities. \$130,000	Enhance visitor services on McFaddin NWR by developing interpretive and wildlife observation facilities. Nature tourism is expanding rapidly on the Texas Gulf Coast, and although this coastal refuge provides great opportunities for wildlife observation and nature interpretation, facilities are minimal. Public use occurs year-round and includes all six priority uses - wildlife observation and photography, fishing, waterfowl hunting, environmental education and interpretation. The Refuge is a prime site on the Great Texas Birding Trail. To commemorate the Refuge System Centennial, facilities including a kiosk with interpretive panels, observation platforms, and boardwalks will be developed. All aspects of this project have high partnership potential with conservation organizations, industry and local agencies.
2005260636	Large Bridge Rehabilitation/Replacement [p/d/cc]. \$1013,000	This project includes the planning, design, and construction to replace one bridge and rehabilitate a second bridge at McFaddin NWR. Currently, the condition of both bridges represents a significant safety hazard. Specifically, the Ten-Mile Cut Bridge will be replaced and the Star Lake Corps Structure Bridge will be rehabilitated to include safety features and guardrails. The Ten-Mile Cut Bridge is deteriorated and worn to the point that rehabilitation is not an option as the wood supports are rotted and deteriorated. The Star Lake Corps Structure Bridge is hazardous to users because of the structural and safety deficiencies including deteriorated substructures and bridge decks, and nonexistent or inadequate guardrails and signs.
2006513218	Construct new Water Control Structure at Barnett Lake Outfall and GIWW. \$153,000	Plan, design, and construct a new water control structure on Barnett Lake outfall ditch at the Gulf Intracoastal Waterway, to improve our water management capabilities in the 8,000-acre Wild Cow Bayou Unit. Man-made changes off refuge in the watershed have increased drainage time in this unit which has adversely affected the health of the marsh. This structure would allow us to more effectively manage water by releasing it at the top of the watershed during extreme high water conditions. Structure would be forty-feet long, 60" pipe with concrete headers, a flap-gate at the outfall, a screwgate, and a half-round riser on the inside. Planning, design, and construction contracting can be accomplished in 1 year.

CONSTRUCTION MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
2006513221	Construct new Water Control Structure at Willow Lake Outfall Ditch and GIWW. \$153,000	Plan, design, and construct a water control structure on the Willow Lake outfall Ditch at the Intracoastal Waterway to improve our water management capabilities in the 8,000-acre Wild Cow Bayou Unit. Man-made changes off refuge in the watershed have increased drainage time in this unit which has adversely affected the health of the marsh. This structure would allow us to more effectively manage water by releasing it at the top of the watershed during extreme high water conditions. Structure would be forty-foot long, 60" pipe with concrete headers, a flap-gate at the outfall, a screwgate, and a half-round riser on the inside. Planning, design, and construction contracting can be accomplished in one year.
2006519024	Construct new Water Control Structure at O-Ditch and GIWW. \$153,000	Plan, design, and construct a new water control structure on O-Ditch at the Intracoastal Waterway, to improve our water management capabilities in the 8,000-acre Wild Cow Bayou Unit. Man-made changes off refuge in the watershed have increased drainage time in this unit which has adversely affected the health of the marsh. This structure would allow us to more effectively manage water by releasing it at the top of the watershed during extreme high water conditions. Structure would be a forty-foot long, 60" pipe with concrete headers, a flap-gate at the outfall, a screwgate, and a half-round riser on the inside. Planning, design, and construction contracting can be accomplished in one year.
2006519066	Construct new administrative facility for McFaddin/Texas Point NWRs. \$920,000	Construct a new administrative office facility for McFaddin/Texas Point NWR staff. This 3,500 square foot facility will house the 10 person refuge staff, and contain a 400 square foot area for providing visitor services and information. Electrical, telephone and water utilities will be provided through adjacent city utility lines; septic will have to be developed on-site. Current administrative is a very old retrofitted hunting club. The building is greater than 50 years old and falling apart. This new building will negate health and safety hazards posed by the current facility and meet required Refuge operational goals and objectives.
2006519059	Construct three residences to house refuge staff. \$2088,000	Construct three residences to house refuge staff of McFaddin and Texas Point NWRs. These three bedroom, double garage residences will house refuge management and biological staff. Likely location for the residences is within the community of Sabine Pass, adjacent to Texas Point NWR. Electrical, water, and telephone service is available from existing utility infrastructure along State Highway 87; septic systems will have to be developed on-site. There is only one residence currently located on McFaddin National Wildlife Refuge. The closest (12 miles) town is Sabine Pass, which is very small and does not offer real estate opportunities. The next closest (25 miles) town to the Refuge is Port Arthur. Due to the distance from the Refuge to the closest place for employees to live, many individuals will not seek employment at McFaddin National Wildlife Refuge. Construction on Refuge residences will facilitate staffing and recruitment opportunities for McFaddin and Texas Point National Wildlife Refuges.
2006535867	Rehabilitate and retrofit old and deteriorating office building. \$380,000	Rehabilitate and expand the existing administrative building. The building has experienced significant deterioration that has been accelerated due to the influence of saltwater. The electrical system, roof, and siding need to be replaced. This 1,694 square foot building provides office space for seven staff members. Due to insufficient space, staff members are forced to share offices, and storage space insufficient. The buildings present conditions present numerous health and safety hazards.

CONSTRUCTION MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
2006535718	Construct Fishing piers, boat docks and ramps, parking areas and waterway access. \$181,000	Improve access and enhance opportunities for public waterfowl hunting and fishing on McFaddin NWR. Facilities which improve access for public recreation are a critical need to support this Refuge's growing public use program. Fishing piers, boat docks and ramps, parking areas and waterway access will be developed to support these popular activities. Families visit this coastal refuge daily to enjoy excellent recreational fishing and crabbing, and the Refuge also hosts the largest public waterfowl hunt in Texas, serving over 6,000 hunters annually. This project has high partnership potential with local outdoor organizations and volunteers. Based on the latest Fish and Wildlife Service data available, the additional visitors are expected to contribute \$91,698 to the local economy.

CONSTRUCTION MMS REPORT FOR TEXAS POINT NWR

Work Order #	Project Title and Cost	Project Description
00123698	Construct interpretive and wildlife observation facilities. \$78,000	Enhance visitor services on Texas Point NWR by developing interpretive and wildlife observation facilities. Nature tourism is expanding rapidly on the Texas Gulf Coast, and although this coastal refuge provides great opportunities for wildlife observation and nature interpretation, facilities are minimal. Public use occurs year-round and includes all six priority uses - wildlife observation and photography, fishing, waterfowl hunting, environmental education and interpretation. The Refuge is a prime site on the Great Texas Birding Trail. To commemorate the Refuge System Centennial, facilities including a kiosk with interpretive panels, an observation platform, and a boardwalk will be developed. All aspects of this project have high partnership potential with conservation organizations, industry and local agencies.
97122668	Develop volunteer housing for McFaddin and Texas Point NWR. \$158,000	Recruitment and retention of non-permanent staff and volunteers at these refuges is negatively affected by lack of housing. Housing opportunities in the nearby community of Sabine Pass are extremely limited, and most staff must reside in the nearest communities, located one hour or more commuting distance from Refuge headquarters. A mobile/prefab bunkhouse facility will be installed on Texas Point NWR, and connected to Sabine Pass municipal services.
00115512	Replace One-Quarter Mile Watchable Wildlife Trail. \$26,000	Replace the present dirt public use trail with a wooden boardwalk trail. The trail is heavily utilized by bird watchers. It is constructed of earthen material. Heavy rains and tropical storms have caused significant erosion of the trail. Due to frequent rains and storms the trail stays in a condition of disrepair. A wooden boardwalk will built over the entire length of the 0.25 mile trail in order to eliminate reoccurring maintenance needs and provide an adequate trail for public use.
2006510862	Develop volunteer housing for McFaddin and Texas Point NWR. \$158,000	Recruitment and retention of non-permanent staff and volunteers at these refuges is negatively affected by lack of housing. Housing opportunities in the nearby community of Sabine Pass are extremely limited, and most staff must reside in the nearest communities, located one hour or more commuting distance from Refuge headquarters. A mobile/prefab bunkhouse facility will be installed on Texas Point NWR, & connected to Sabine Pass municipal services.
2005171350	Replace Barbed wire Fence at Texas Point NWR	Replace 10 miles of damaged barbed wire fence. This fence has been severely damaged by storms and fires. All of the fence posts have rotted and no longer support the wire. Barbed-wire has deteriorated to rusting. This fence provides the only barrier between adjacent private lands and the refuge. The fence will no longer hold cattle. Therefore, the refuge has not been able to implement its grazing program. Adjacent landowners trespass on the refuge, due to the deteriorated fence. Illegal grazing is adversely affecting habitat conditions on the refuge.
2005267301	Replace One-Quarter Mile Watchable Wildlife Trail. \$26,000	Replace the present dirt public use trail with a wooden boardwalk trail. The trail is heavily utilized by bird watchers. It is constructed of earthen material. Heavy rains and tropical storms have caused significant erosion of the trail. Due to frequent rains and storms the trail stays in a condition of disrepair. A wooden boardwalk will built over the entire length of the 0.25 mile trail in order to eliminate reoccurring maintenance needs and provide an adequate trail for public use.

CONSTRUCTION MMS REPORT FOR TEXAS POINT NWR

Work Order #	Project Title and Cost	Project Description
2006535986	Construct interpretive and wildlife observation facilities. \$78,000	Enhance visitor services on Texas Point NWR by developing interpretive and wildlife observation facilities. Nature tourism is expanding rapidly on the Texas Gulf Coast, and although this coastal refuge provides great opportunities for wildlife observation and nature interpretation, facilities are minimal. Public use occurs year-round and includes all six priority uses - wildlife observation and photography, fishing, waterfowl hunting, environmental education and interpretation. The Refuge is a prime site on the Great Texas Birding Trail. To commemorate the Refuge System Centennial, facilities including a kiosk with interpretive panels, an observation platform, and a boardwalk will be developed. All aspects of this project have high partnership potential with conservation organizations, industry and local agencies.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
04134744	Remove existing bridge and water control structure. \$243,500	The existing structure has damage gates that are allowing salt water and flood water to cross to the adjacent watershed. Adjoining land owners have complained about the impacts of this structure allowing water to cross watershed boundaries. We propose to remove the existing failed structure and replace with bulkheads and an earthen crossing. Recent Bridge inspections conclude that the bridge is currently safe for public crossing. Removal of this structure will prevent salt water from impacting over 600 acres freshwater wetlands in the adjacent watershed and will restore the natural hydrology to this area.
03126441	Rehabilitate East Bay Bayou Levee. \$270,000	Rehabilitate East Bay Bayou Levee (East Bay Bayou Unit) Clean, slope and elevate East Bay Bayou levee on the East Bay Bayou Unit of the East Unit Tract. Protect and bulkhead the East Bay Bayou saltwater barrier. This levee system protects and facilitates management of over 4,100 acre or fresh and intermediate marsh on the refuge and the attached salt water barrier protects 1000's of acres of private land from saltwater intrusion. Significant erosion from tropical storms Allison in 2001 has eroded around the saltwater barrier and has reduced the elevation of the levee.
03126450	Replace the boat canal water control structure and bulkheads.	The current structure has failed. This structure makes it possible to manage water levels, salinities and water quality in 3,900 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. This structure was damaged during tropical storm Frances. Repair efforts in 2002 were not successful because the structure had totally washed out underneath the supports. The structure will be relocated and replaced with an aluminum box culvert with vinyl bulkheads.
03126440	Rehabilitate Elm and East Bay Bayou Levees. \$478,000	Clear, slope and elevate levees on Elm and East Bay Bayou on the Middleton Tract. Protect and bulkhead the saltwater barrier attached to the Elm Bayou levee. This levee system protects and facilitates the management of over 3,500 acres of fresh and intermediate marsh on the refuge and protects 1000s of acres of private land from salt water intrusion. Significant erosion occurred near the salt water barrier and reduced the elevation in key areas of the levee.
03126640	Remove abandoned oil pads in Gator Marsh (LJH). \$47,000	Remove abandoned oil pads in Gator Marsh (LJH) and the 480 units. Pads remain after production ceased. These well pads were present when the refuge purchased these units. We propose to create shallow fresh water wetlands from pad spoil. The wetlands will provide pair pond habitat for declining Mottled Duck populations while removing unwanted infrastructure from valuable wetland habitat. Planning, design and construction contracting can be completed in one year.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126638	Rehabilitate Gator Trail ditch and spoil levee. \$110,000	Rehabilitate the Gator Trail ditch and levee to improve protect this crucial water management infrastructure. Ditch banks are eroding from recent storm flooding and alligator burrowing. Side slope of the ditch needs to be sloped and the spoil removed from ditch work needs to be crowned and sloped. The levee created from construction of this ditch is used to access important water control structures on Oyster Bayou. Over 900 acres of fresh water and intermediate marsh are managed through this ditch systems. It maintain habitat for marsh and wading birds and wintering waterfowl. Planning, design and construction contracting can be accomplished in one year.
03126639	Repair Snipe Prairie levees and remove spoil. \$80,000	Repair Snipe Prairie levees and remove spoil from ponds in the unit to improve water level management. Outside levees have been eroded from flooding. Levees need to be raised and sloped to improve water management within the 100 acre unit. Old spoil areas from dugout ponds should be removed and used to elevate exterior levees. Interior and exterior borrow ditches will be cleaned and sloped. This unit provides excellent habitat for wading birds, shorebirds and wintering waterfowl. It is one of the most popular waterfowl hunting locations on the East Unit Public Hunting area. Restoration will increase wildlife use of the unit and improve hunting opportunities in the fall.
03126637	Replace Coon Creek water control structure. \$188,000	Replace the Coon Creek water control structure. This structure has failed. One half of the structure has filled with silt. Timbers have significantly eroded. This structure will be replaced with a simple rock weir with a shutoff valve to protect inland marshes from oil spills in the Galveston Bay system. A simpler structure will reduce future maintenance while still maintaining the integrity of interior brackish and saline marsh systems. It will improve movement of marine organisms. This structure is adjacent to an prehistoric village site. Special precautions will be necessary to protect archeological resources. The proposed structure replacement will reduce impacts to historic values of the site and will reduce impacts in the future by reducing maintenance.
03126542	Rehabilitate boat canal banks with shoreline protection. \$	Rehabilitate the boat canal banks with shoreline protection. The boat canal banks have experience significant erosion from boat wakes. Erosion has increased the size of the boat canal by five feet. The banks are threatening to erode into the adjacent property owners land. Canal banks will be sloped and armored with cable block and felt. This canal provides boat access to refuge and state waters for tens of thousands of fisherman, hunters and nature enthusiast annually.
03126543	Rehabilitate the tan equipment storage building (Red Wolf). \$115,000	Rehabilitate the tan (Red Wolf) equipment storage building to protect refuge equipment. Portion of the existing floor needs to be covered with concrete, additional lighting is needed, several doors need to be repaired to properly secure the building and make it safe for staff entry during night time hours. Industrial shelving is needed to protect and properly store specific refuge equipment.
03126544	Replace washed out culverts on Westline road ditch. \$89,000	Replace washed out culverts on Westline road ditch used to access yellow Rail Prairie. These culverts were washed out during tropical storm Frances. These culverts provide important access to the Coon Creek and Yellow Rail Prairie units. The culverts will be relocated south of the current location across from the access road to Gator Marsh. They will be protected with vinyl bulkheads to prevent future
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DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126544 Cont.		washouts. The existing structures need to be removed to prevent visitors from falling into the large hole which has developed between the two culverts. Planning, design and construction contracting can be accomplished in one year.
03126546	Rehabilitate ditches and spoil banks in Gator Marsh (LJH) Tract. \$219,000	Rehabilitate the ditches and spoil banks in the Gator Marsh (LJH) Tract to improve water management, native prairie habitat and grazing management in the 1800 acre unit. This tract currently is suffering from poor drainage in the northern portion of the unit. The poor drainage has degraded native prairie habitat, reduced the value of fresh water wetland habitat and the ability to use cattle to meet management objectives within the unit. Approximately 10,000 feet of ditches need to be cleaned. Spoil from the ditch clean outs will need to be removed or sloped and crowned to facilitate water management and improve cattle utilization of the unit. Several existing culverts will need to be replaced and several new culverts are needed to meet the management objectives within the unit. This unit provides hundreds of thousands of waterfowl use days, it is within critical nesting and brood habitat for Mottled Ducks, it is heavily utilized by shorebirds, wading birds, grassland songbirds and other marsh birds. Planning, design and construction contracting can be accomplished in one year.
03126550	Repair or replace boat rollers on the Middleton Tract. \$27,000	Repair or replace boat rollers on the Middleton Tract to facilitate boat access into hunt units of the refuge. Boat rollers provide access to hunters over levees into waterfowl hunt units of the refuge. Boat rollers facilitate almost a one thousand use days for refuge hunters. Wooden supports galvanized and pvc rollers need to be replaced. The existing rollers need to be extended and winch posts need to be installed to facilitate access during low tide events. Planning, design and construction contracting can be accomplished in one year.
03126552	Rehabilitate East Bay Bayou walking trail. \$68,000	Rehabilitate the East Bay Bayou walking trail to improve visitor use and experiences. Improvements of this trail are sure to allow more visitors to appreciate wildlife resources on the refuge. The existing trail system needs to be crowned and resurfaced with rock to improve walking conditions. Existing culverts need to be replaced and additional culverts installed to reduce flooding, erosion and the tripping hazards along portions of the trail. Directional & interpretive signs will be installed to direct visitors along the trail.
03126557	Rehabilitate East Bay Bayou Tract moist soil levees. \$103,000	East Bay Bayou Tract moist soil units are used to demonstrate rice farming and moist soil management techniques to improve wetland wildlife habitat. The existing interior levees in fields 116, 64 and 63 need to be surveyed and reconstructed to improve water management within each field. Outside levees need to be improved and structures installed to improve the services ability to manipulate water levels for shorebird management. It is difficult to prepare the current fields in early spring for shorebird management because of poor levee condition and placement which makes it difficult to drawdown fields. These fields provide important opportunities for landowners, duck clubs, farmers and outfitters to learn about freshwater wetland management techniques which can be used to improve wildlife habitat and individual land management operations. Tens of thousands of visitors visit this tract to view wildlife and fish each year. These fields also provide tens of thousands of use days for waterfowl, shorebirds and wadingbirds each year. Design and construction contracting can be accomplished in one year.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126564	Rehabilitate interior ditches in the Middleton Tract. \$37,000	Rehabilitate the interior ditches in the Middleton tract used to facilitate water management and access to hunt units. These ditches are critical to the water management of 3,700 acres of marsh habitat and facilitating access for waterfowl hunting each fall. Ditches provide boat access to hundreds of waterfowl hunters each fall and winter. Ditches will be cleaned by removing vegetation and accumulated sediments using mud boats supported by a backhoe. These ditches are used to flood and dewater, manage salinities, flush to improve water quality and remove flood waters within the unit. Marsh habitat on the Middleton Tract is important to migrating & wintering waterfowl, nesting Mottled Ducks & marsh wildlife species. Planning, design & construction contracting can be completed in 1 year.
03126612	Rehabilitate Unit One Rice Field ditches on the East Unit. \$151,000	Rehabilitate Unit One Rice Field ditches to improve water management capabilities in rice fields and moist soil units. Approximately 6500 feet of ditches need to have vegetation cleared and spoil areas crowned and sloped to improve water management capabilities on this 670 acres unit. These units provide important migratory and wintering habitat for waterfowl and shorebirds. Planning, design and construction contracting can be accomplish in one year.
03126506	Rehabilitate the Oyster Bayou boat ramp. \$122,000	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp to improve accessibility. The current launch will be expanded and improved to allow two boats to be launched at the same time, install a solar powered light, and modify the dock to make it accessible in variable tide conditions. The current launch is not lighted and visitors have damaged supports while launching at night.
03126634	Repair and protect levees on the East Unit. \$423,000	Repair and protect levees along the Gulf Intracoastal waterway (GIWW) on the lower end of the East Unit to protect inland marshes and roads. These levees are eroding at very rapid rates. Repair of low areas along the GIWW and shoreline protection are critical to protecting thousands of acres wetland habitat and one mile of road. These marshes are valuable habitat for migratory waterfowl, shorebirds, wading birds, nesting Mottled Ducks and other marsh birds. Protection of and sloping of levees with rock barriers and cordgrass plantings will protect 6000 acres of marsh from saltwater intrusion and marsh loss. Planning, design and construction engineering can be completed in one year.
03126635	Repair levees along the GIWW (Roberts Mueller and Pace Tracts). \$496,000	Repair and protect levees along the Gulf Intracoastal waterway(GIWW) on the Roberts Mueller and Pace Tracts to protect inland marshes and roads. These levees are eroding at very rapid rates. Repair of low areas along the GIWW and shoreline protection are critical to protecting thousands of acres wetland habitat and one mile of road. These marshes are valuable habitat for migratory waterfowl, shorebirds, wading birds, nesting Mottled Ducks and other marsh birds. These units receive over a million waterfowl use day annually. They are one of the most important wintering and migratory waterfowl rest areas on the Gulf Coast. Protection of and sloping of levees with rock barriers and cordgrass plantings will protect 4000 acres of marsh from saltwater intrusion and marsh loss. Planning, design and construction engineering can be completed in one year. These levee and spoil areas are not under easement with the US Army Corps of Engineers.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
03126468	Replace the Otter Slough water control structure and bulkheads	Replace the Otter Slough water control structure and bulkheads. The current structure has failed. This structure makes it possible to manage water levels, salinities and water quality in 4,500 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. This structure was damaged during tropical storm Frances. Repair efforts in 2002 were not successful because the structure had totally washed out underneath the supports. The structure will be relocated and replaced with an aluminum box culvert with vinyl bulkheads.
03126469	Replace the New Ditch water control structure. \$144,000	Replace the New Ditch water control structure and bulkheads. The current structure is insufficient for the water shed that it supports. This structure makes it possible to manage water levels, salinities and water quality in 6,500 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. The structure will be relocated and replaced with a larger aluminum box culvert with vinyl bulkheads. Planning and design is underway and the construction can be completed in one year.
03126548	Replace the old wooden bridge on the east side. \$78,000	Replace the old wooden bridge on the east side of Gator Marsh road. Bridge inspections have revealed that this bridge is no longer safe to cross. Closure of this bridge has limited access to this portion marsh for grazing and small vehicle access reducing the value for wetland wildlife. The proposed project would remove the existing condemned bridge and replace it with a culvert crossing. Replacing the wooden bridge with a simple culvert would reduce future management costs and facilitate grazing access to meet marsh management objectives for the unit. Southern portions of this unit provide hundreds of thousands of waterfowl use days, it is within critical nesting and brood habitat for Mottled Ducks, it is heavily utilized by shorebirds, wadingbirds, grassland songbirds and other marsh birds. Improving access to the northern portion of the tract could create favorable conditions found in the southern portion of the unit. Planning, design and construction contracting can be accomplished in one year.
02116082	Rehabilitate over 30,000 feet of drainage ditches on Pintail Marsh Unit. \$359,000	Rehabilitate over 30,000 feet of drainage ditches. Grade and slope spoil to facilitate management of refuge rice farming and moist soil program. This drainage system facilitates water management on over 900 acres of the refuge cooperative rice farming program, 80 acres of moist soil units, and 350 acres of native prairie. The current drainage ditch does not allow effective water management in rice units and is preventing sheet flow into wetlands and away from native prairie. Cleaning ditches, replacing 14 culverts, grading, and sloping of spoil areas will significantly improve the water management of this unit. NOTE: Work will not require engineering assistance. Work will be accomplished through a requirements contract for services.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
02116460	Remove shop and boat storage buildings soon be replaced. \$108,000	Remove old shop and boat storage buildings which will soon be replaced. These buildings will need to be removed to facilitate construction of the boat storage building in 2005. The refuge water system is located in the old shop building. It will need to be elevated and protected during demolition and construction. The removal of these buildings will allow the refuge to continue operations that are critical to all aspects of refuge management.
02116456	Entrance road (Rte 10, 3.2 mi)	Construction. Repair the main entrance road to the refuge. We propose placing an alternative surface to the road to reduce the amount of dust and improve driving conditions for the visiting public. Dust from the constant travel of visitors make driving hazardous during dry summer months. This road is traveled by over 70,000 visitors annually. It is the most traveled and visible road on the refuge. Paving or placing an alternative surface to this road will improve driving conditions and reduce the possibility for collisions.
02116191	Replace 18' Wooden Water Control Structure (Salt Barrier), East Unit. \$95,000	Replace the 18-foot wooden water control structure on the East Bay Bayou Tract located on the East Unit. The structure serves as a saltwater barrier to reduce movement of salt water through a major drainage ditch to fresh water wetlands upstream. The structure has been damaged by flooding and marine burrowing worms. The structure was temporarily repaired in FY2000 however will soon fail again. Replacement of this structure is critical to facilitating protection and management of over 1800 acres of fresh and intermediate marsh.
02116435	Repair and Move Refuge Above Ground Fuel Tanks. \$47,000	Repair and Move Refuge Above Ground Fuel Tanks. Unleaded and diesel pumps, exterior vents and fill pipes are in poor condition. The pumps require an assessment to determine if they will need to be replaced. The pumping system needs to be moved and modified to meet requirements of the refuge spill prevention, contingency and counter measure plan. The pump system is located in an area prone to flooding. Moving the tanks will reduce the potential for flooding fueling areas and limit the impacts if a fuel spill were to occur.
02116071	Replace the 48-inch by 30-foot, double, aluminum water control structure. \$90,000	Replace the 48-inch by 30-foot, double, aluminum water control structure located on the west end of the Mitigation Area Unit. This structure has significantly deteriorated because of erosion and decay. The structure manages water levels in 300 acres of saline marsh. If this structure is not replaced, portions of an important access road will no longer provide critical access to staff.
97110189	Remove abandoned drill pads, pipelines, and misc equipment. \$1,150,000	The Roberts-Mueller oil field will be cleaned and restored by removing abandoned drill pads, pipelines, and miscellaneous equipment. This infrastructure, abandoned by previous oil field operations, reduces habitat quality and presents safety hazards to refuge staff. The project will eliminate safety hazards, directly restore 50 acres, and enhance over 300 acres of coastal wetlands.
97110190	Windmill Rd & parking (Rte 11, 6.7 mi) \$ 2382,000	Construction. Repair 9 miles of roads and parking areas in the Old Anahuac Unit from the shop to Frozen Point (Windmill Road). Project will include restoring and crowning roadbeds, re-graveling and cleaning road ditches. These roads provide recreational opportunities for over 60,000 visitors annually and provide the only public access to the north side of East Galveston Bay.

DEFERRED MAINTENANCE MMS REPORT FOR ANAHUAC NWR

Work Order #	Project Title and Cost	Project Description
90110192	Repair East Unit farm roads. \$1191,000	Repair East Unit farm roads by restoring and crowning roadbed and cleaning road ditches. These roads provide access for rice farming and moist soil management, two practices aimed at providing high quality habitat for wintering waterfowl and for public waterfowl hunting. Maintenance will increase the longevity of these roads, and provide cost-savings by preventing the need for major repairs.
98107382	Replace washed-out Pace Tract culverts. \$165,000	Replace water control structures and repair wash outs on the Pace Tract. These structures are corroded and erosion has occurred due to repeated flooding. Structures are needed to minimize harmful impacts of salt water intrusion and erosion in adjacent wetlands. Replacing structures will protect and enhance 1,400 acres of important waterfowl habitat.
96110191	Oyster Bayou Rd (Rte 103, 2.1 mi) \$1094,000	Construction. Rebuild and re-gravel 4 miles of Oyster Bayou Road. This road is currently closed to the public due to its deteriorated condition. Reopening this road will provide recreational opportunities for over 20,000 visitors annually.
99107421	Repair bridge access crossing East Bay Bayou by repairing washouts. \$38,046	Repair bridge access crossing East Bay Bayou by repairing washouts. Erosion on both sides of the bridge threatens its integrity, and it has not been signed according to Federal safety standards. It may soon become a safety hazard and could wash out during another significant storm event if not repaired. This bridge is regularly used by staff for operations and law enforcement, and by over 10,000 visitors annually. It is also used as an accessible fishing and nature observation area.
97107398	Repair East Bay boat ramp parking area. \$28,000	Repair East Bay boat ramp parking area by restoring base and re-gravelling surface. This parking area has been damaged by flooding and heavy use. Visitors been stuck and vehicles damaged in the parking area increasing the risk for injury. A smoother surface also makes the parking area usable to visitors in wheelchairs. It receives year-round use by over 25,000 visitors annually. The boat ramp is also used by law enforcement agencies during emergencies. The refuge's East Bay boat ramp provides the only public access to the north side of East Galveston Bay.
97107408	Repair East Unit reservoir levees and water control structures. \$92,000	Rehabilitate eroded East Unit reservoir levees and water control structures. Replace inoperable structures, slope and crown levees, rehabilitate pump station, and control exotic Chinese tallow trees. This infrastructure facilitates manipulation of water levels to enhance migratory bird habitat in this 200-acre freshwater impoundment. This wetland also supports numerous resident fish and wildlife species.
97107409	Rehabilitate Alice Jackson White and Granberry unit roads. \$491,000	Rehabilitate 10 miles of deteriorating Alice Jackson White and Granberry unit roads by restoring and crowning roadbeds, cleaning road ditches, and replacing culverts. These roads provide management access to water control structures, grazing units, and prairie restoration sites. Maintenance will increase the longevity of these roads and provide cost savings by preventing the need for major repairs.
97107410	Remove old cattle shelters from Jackson/White and Old Anahuac. \$43,000	Remove old cattle shelters from Jackson/White and Old Anahuac by tearing down wooden and sheet metal structures and disposing of materials. These structures are severely deteriorated, no longer function, and pose a safety hazard to staff and refuge permittees. Removal of the cattle shelters will eliminate the safety hazards and enhance the natural resources.
97107412	Replace eroded Middleton Tract water control structure. \$340,000	Replace eroded Middleton Tract water control structures along East Bay Bayou by removing existing aluminum structures and installing new structures. Washouts below and around these structures are threatening their integrity and limiting management capabilities. This project will protect and enhance 3,400 acres of important coastal wetland and prairie habitats.

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Work Order #	Project Title and Cost	Project Description
97107414	Replace Shop Complex security fence. \$35,000	Replace the Shop Complex chain-link security fence with a new fence. This fence is deteriorated to the point that it no longer serves as a barrier to outside entry. Vandalism and theft of government property is an ongoing problem at the Shop.
97107415	Repair Boat Canal public boat ramp and parking area. \$27,000	Repair Boat Canal public boat ramp and parking area by re-gravelling the ramp runway and parking area, and replacing the concrete boat ramp. This popular public boat ramp provides access to Oyster Bayou and East Galveston Bay for recreational fishing, waterfowl hunting, and wildlife viewing. It serves over 20,000 visitors annually and is used by refuge staff to conduct law enforcement and other operations.
98107416	Rehabilitate Robert's Mueller spoil area levee. \$117,000	Rehabilitate Robert's Mueller spoil area levee which is severely eroded and nonfunctional by repairing washouts, resloping and crowning the levee, and removing Chinese tallow trees. This project will restore a 25-acre wetland and allow the reestablishment of a colonial nesting water bird rookery.
96107419	Rehabilitate Old Anahuac pump station. \$66,000	Rehabilitate Old Anahuac pump station by replacing pump and repairing support infrastructure. The existing pump requires constant repairs, and the supports have excessive rust and wear. This equipment supplies water to the Oyster Bayou Moist Soil Unit, which is the site of a partnership project with Ducks Unlimited. This 400-acre wetland provides excellent habitat for waterfowl and other migratory birds.
2006508111	Shoveler Pond Rd (Rte 12, 3.4mi). \$736,000	Construction. Repair Shoveler Pond Road by restoring and crowning roadbed, re-gravelling surface and cleaning road ditches. The roadbed is eroded and flooding has removed surface gravel. This road is part of the refuge auto tour loop and provides access to Shoveler Pond and the Willows, two popular wildlife viewing areas. These facilities are visited by over 40,000 people annually.
98107457	Shoveler Pond Rd (Rte 12, 3.4mi). \$736,000	Construction. Repair Shoveler Pond Road by restoring and crowning roadbed, re-gravelling surface and cleaning road ditches. The roadbed is eroded and flooding has removed surface gravel. This road is part of the refuge auto tour loop and provides access to Shoveler Pond and the Willows, two popular wildlife viewing areas. These facilities are visited by over 40,000 people annually.
97107394	Remove abandoned buildings, trailers, equipment and trash. \$53,000	Remove abandoned buildings, trailers, equipment and trash from the Middleton Tract. These materials were left when this tract was acquired in 1995 and pose a threat to public safety. The Middleton Tract is part of the refuge public waterfowl hunting program. The project will remove this hazard, any threat of pollution, and enhance aesthetics.
96107396	Rehabilitate levees and water delivery system to Rail Reservoir Moist Soil Unit. \$71,000	Rehabilitate 26,000 feet of levees and water delivery system to Rail Reservoir Moist Soil Unit by sloping, controlling tallow, and replacing culverts. This infrastructure facilitates water management on this 100-acre freshwater wetland, which in turn creates quality habitat for waterfowl, shorebirds, and wading birds, and for many resident fish and wildlife species.
96107397	Replace foot bridge to East Unit reservoir. \$53,000	Replace foot bridge to East Unit reservoir. This bridge was completely destroyed by flooding and is closed. Replacement will improve access to the reservoirs on the popular East Unit public waterfowl hunt area, which serves over 6,000 hunters annually.

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Work Order #	Project Title and Cost	Project Description
99107495	Replace Lone Tree Bayou bridge/water control structure. \$104,000	Replace Lone Tree Bayou bridge/water control structure (Property #0087). Erosion on both sides of this structure threatens its integrity. The bridge will become a safety hazard if erosion continues. Bridge provides staff access for law enforcement, fire management, and habitat management activities. Water control structure protects 2,100 acres of coastal wetlands.
97107448	Repair East Unit Road. \$253,032	Repair deteriorated main East Unit road by restoring the roadbed, crowning and re-gravelling the surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.
97107449	Cross & West Line Rds (Rte 101, 102; 3 mi) \$658,000	Repair 2.2 miles of East Bay Bayou Tract roads and parking areas by restoring and crowning roadbeds, re-gravelling surfaces and cleaning road ditches. This area provides recreational opportunities for over 25,000 visitors annually. This tract was recently opened to the public through a multi-partner project involving several conservation groups, industry, and individuals. This portion of the Refuge provides high quality birding, recreational fishing, and general wildlife observation opportunities.
96107385	Rehabilitate levees and replace water control structures and culverts. \$131,000	Rehabilitate 3 miles of levees and replace water control structures and culverts. Management capabilities are severely hindered by current state of disrepair. This 150 acre freshwater wetland provides valuable habitat for waterfowl, shorebirds, and wading birds, including important brood-rearing and molting habitat for the resident Mottled Duck.
90107386	Replace 6 rusted and worn cattle guards. \$31,000	Replace 6 rusted and worn cattle guards that have deteriorated to the point where cows used in the refuge grazing program could exit grazing units onto refuge and county roads, where they pose a significant hazard to motorists. This project will reduce potential for conflicts with refuge visitors, enhance public safety, and protect sensitive habitats where grazing is not allowed.
97107388	Rehabilitate flood damaged refuge boat canal. \$172,000	Rehabilitate flood damaged refuge boat canal by removing silt, repairing levees, and replacing a 36 inch culvert and water control structure. The boat canal provides access to quality recreational fishing, waterfowl hunting, and wildlife observation for over 10,000 refuge visitors annually and for staff conducting law enforcement and other operations.
90107389	Replace deteriorated boat and vehicle storage building. \$460,000	Replace deteriorated boat and vehicle storage building. This 1,250 square foot, 35-year old building has rusted structural supports, has a leaky roof, and is rodent infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture and high salt environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in cost savings.
90107390	Replace fences on the Gator Marsh, Granberry, and Mitigation Area units. \$70,000	Replace 6 miles of deteriorated fences on the Gator Marsh, Granberry, and Mitigation Area units. Fences require constant repair to remain functional, and conditions could result in a public safety hazard on refuge roads if cattle escape. This project will reduce potential for conflicts with refuge visitors and neighboring landowners, and protect sensitive habitats where grazing is not allowed.
97107391	Rehabilitate 4 miles of Jackson Ditch. \$180,000	Rehabilitate 4 miles of Jackson Ditch by repairing a washout at the water control structure and removing excess silt. Bank erosion and siltation at the water control structure is impairing its function and threatens its stability. Maintenance of this drainage infrastructure will protect over 8,000 acres of coastal wetland habitats.

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Work Order #	Project Title and Cost	Project Description
97107392	Replace and repair fences on the Middleton Tract. \$70,000	Replace and repair 8 miles of deteriorated fences on the Middleton Tract. Fences require constant repair to remain functional, and conditions could result in a public safety hazard on State Highway 124 if cattle escape. This project will also reduce potential for conflicts with neighboring landowners and protect sensitive habitats where grazing is not allowed.
99107424	Repair bridge near Boat Canal by repairing washouts. \$84,000	Repair bridge near Boat Canal by repairing washouts. Erosion on both sides of this structure threatens its integrity will become a safety hazard if it continues. Bridge provides access for law enforcement, fire management, and habitat management activities. Water control structure protects 6,500 acres of coastal wetlands.
99107425	Replace restroom facilities on Oyster Bayou and East Bay Boat Ramp. \$57,000	Replace restroom facilities on Oyster Bayou and East Bay Boat Ramp. These facilities are over 25 years-old and are no longer functioning because of damage from tropical storms and excessive wear. Visitors are inconvenienced by the restrooms' closure as they are located in popular recreational, but remote, areas. These facilities will be used by over 20,000 refuge visitors annually.
97107444	Replace damaged East Unit 4,000 square foot metal storage building. \$450,000	Replace damaged East Unit 4,000 square foot metal storage building which is 20-years-old, has a leaky roof, is rusted and rodent-infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture/high salt marine environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in significant cost savings.
96107399	Rehabilitate levees on White-fronted Goose Moist Soil Unit. \$50,000	Rehabilitate levees on White-fronted Goose Moist Soil Unit by sloping, removing tallow trees, and replacing water control structures. This infrastructure facilitates water management on this 200 acre freshwater wetland, which in turn creates quality habitat for wintering waterfowl, shorebirds, and wading birds. These habitats also provide brood-rearing and molting habitat for Mottled Ducks.
97107400	Replace Middleton Tract boat ramp and dock with new facilities. \$27,000	Replace Middleton Tract boat ramp and dock with new facilities. Severe erosion has destroyed the ramp and the wooden dock is severely deteriorated. This project will enhance visitor safety and improve access to the Middleton Tract for over 2,000 waterfowl hunters annually.
96107401	Rehabilitate levees and water control structures on the Otter Pond Unit. \$133,000	Rehabilitate levees and water control structures on the Otter Pond Unit by sloping, controlling exotic Chinese tallow trees, and replacing culverts. This infrastructure facilitates water management on this 40-acre freshwater wetland, which in turn creates high quality habitat for waterfowl, shorebirds, and wading birds, and for resident fish and wildlife. Water control structures in this unit also facilitate water management in the 200 acres Shoveler Pond and 100 acres of freshwater wetlands in previous agricultural fields on the Granberry Tract. If structures are not replaced soon it could impact safe travel on Granberry and Shoveler Pond roads.
96107402	Rehabilitate levees and water control structures. 100,000	Rehabilitate levees and water control structures on Water Moccasin Pond by sloping, controlling exotic Chinese tallow trees, and replacing culverts. This infrastructure facilitates water management on this 100-acre freshwater wetland, which in turn creates quality habitat for waterfowl, shorebirds, and wading birds, and for many resident fish and wildlife species.
96107403	Rehabilitate levees on Whimbrel Rice Mngmnt. Unit. \$30,000	Rehabilitate levees on by sloping, controlling tallow, and replacing culverts. This infrastructure facilitates fall and winter flooding of this unit, creating high quality habitat for waterfowl, shorebirds, and wading birds. This project has high partnership potential with Ducks Unlimited and other conservation groups.

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Work Order #	Project Title and Cost	Project Description
97107404	Remove levees, canals and ditch spoil. \$135,000	Remove levees, canals and ditch spoil adjacent to Middleton Tract rice fields. This tract is no longer farmed, and levees, canals and spoil interrupt sheet flows to important marsh and prairie habitats. This project will remove infrastructure which is no longer needed, restore natural hydrology and facilitate resource protection and habitat restoration of rare native prairie grasses on over 250 acres.
91107405	Repair East Bay erosion control bulkheads. \$194,000	Rehabilitate damaged erosion control bulkheads on East Galveston Bay shoreline. Loss or damage of these structures has resulted in increased rates of shoreline erosion and associated wetland loss. Damaged structures will be replaced with offshore rock barriers which reduce erosion and restore wetland habitats by facilitating establishment of emergent marsh vegetation.
90107407	Repair inoperable windmills in Old Anahuac Unit. \$88,000	Repair inoperable windmills in Old Anahuac Unit by replacing broken parts, cleaning wells, and replacing pumps. Loss of windmills has decreased freshwater supply for the refuge's controlled grazing program and for wetland enhancement projects. This project will benefit management of prairie and wetland habitats on the refuge.
96107451	Replace deteriorated waterfowl hunter foot bridges. \$47,000	Replace deteriorated waterfowl hunter foot bridges. These wooden bridges have deteriorated due to the harsh marine environment. Structural soundness is questionable, posing safety risks to the public and staff. This project will enhance public safety and visitor services on the popular East Unit public waterfowl hunting area, which serves 6,000 users annually. It has high partnering potential.
97107454	Repair deteriorated East Unit reservoir road. \$84,000	Repair deteriorated East Unit reservoir road (Property #0273) by restoring the roadbed, crowning and re-gravel surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.
98107456	Boat Ramp Rd (Rte 100, 0.24mi) \$55,000	Construction. Rehabilitate Boat Ramp Road by restoring and crowning roadbed, re-gravel surface and cleaning road ditches. This road provides access to the popular Boat Canal public boat ramp, which provides access to Oyster Bayou and East Galveston Bay for fishing, waterfowl hunting and wildlife viewing.
90107450	Replace Refuge entrance sign. \$24,000	Replace deteriorated Refuge entrance sign. The area's harsh marine environment has faded sign, eroded its rock base, and rotted wooden supports. Located on heavily traveled roadway, this highly visible sign is an important milepost which both informs visitors and promotes the refuge.
2006506111	Rehabilitate boat canal banks with shoreline protection. \$	Rehabilitate the boat canal banks with shoreline protection. The boat canal banks have experience significant erosion from boat wakes. Erosion has increased the size of the boat canal by five feet. The banks are threatening to erode into the adjacent property owners land. Canal banks will be sloped and armored with cable block and felt. This canal provides boat access to refuge and state waters for tens of thousands of fisherman, hunters and nature enthusiast annually.
2005158594	Replace butler Building \$318,000	Replace Butler office building at the refuge shop complex. This 35-year old building has rusted structural supports, rusted and failing flooring, a leaky roof, and is rodent infested. Persistent leaking of the roof has created a significant mold problem inside the building. It provides office space and facilities, lunch room, and restrooms for maintenance staff and fire crew. This project will alleviate safety concerns related to the condition of the current building.

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Work Order #	Project Title and Cost	Project Description
2005158604	Replace Otter Slough water structure \$104,000	Replace the Otter Slough water control structure and bulkheads. The current structure has failed. This structure makes it possible to manage water levels, salinities and water quality in 4,500 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. This structure was damaged during tropical storm Frances. Repair efforts in 2002 were not successful because the structure had totally washed out underneath the supports. The structure will be relocated and replaced with an aluminum box culvert with vinyl bulkheads.
2005172074	Replace Butler Building \$51,000	Replace Butler office building at the refuge shop complex. This 35-year old building has rusted structural supports, rusted and failing flooring, a leaky roof, and is rodent infested. Persistent leaking of the roof has created a significant mold problem inside the building. It provides office space and facilities, lunch room, and restrooms for maintenance staff and fire crew. This project will alleviate safety concerns related to the condition of the current building.
2005167936	Replace butler building \$267,000 Anahuac	Replace Butler office building at the refuge shop complex. This 35-year old building has rusted structural supports, rusted and failing flooring, a leaky roof, and is rodent infested. Persistent leaking of the roof has created a significant mold problem inside the building. It provides office space and facilities, lunch room, and restrooms for maintenance staff and fire crew. This project will alleviate safety concerns related to the condition of the current building. Critical health and safety issues have increased due to mold conditions inside the building.
2005168644	Entrance Road (Rte 10) DM pt2	FHWA Construction project costs based upon engineers estimate. Construction. Repair the main entrance road to the refuge. We propose placing an alternative surface to the road to reduce the amount of dust and improve driving conditions for the visiting public. This part of the project is for resurfacing the roadway. Dust from the constant travel of visitors make driving hazardous during dry summer months. This road is traveled by over 70,000 visitors annually. It is the most traveled and visible road on the refuge. Paving or placing an alternative surface to this road will improve driving conditions and reduce the possibility for collisions.
2005177764	Repair deteriorated main East Unit road.	Repair deteriorated main East Unit road by restoring the roadbed, crowning and re-gravelling the surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.
2005177774	Repair deteriorated main East Unit road.	Repair deteriorated main East Unit road by restoring the roadbed, crowning and re-gravelling the surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.

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Work Order #	Project Title and Cost	Project Description
2005178664	Rehabilitate East Bay Bayou Levee (East Bay Bayou Unit)	Rehabilitate East Bay Bayou Levee (East Bay Bayou Unit) Clean, slope and elevate East Bay Bayou levee on the East Bay Bayou Unit of the East Unit Tract. Protect and bulkhead the East Bay Bayou saltwater barrier. This levee system protects and facilitates management of over 4,100 acre or fresh and intermediate marsh on the refuge and the attached salt water barrier protects 1000's of acres of private land from saltwater intrusion. Significant erosion from tropical storms Allison in 2001 has eroded around the saltwater barrier and has reduced the elevation of the levee.
2005180778	Replace eroded Middleton Tract water control structure	Replace eroded Middleton Tract water control structures along East Bay Bayou by removing existing aluminum structures and installing new structures. Washouts below and around these structures are threatening their integrity and limiting management capabilities. This project will protect and enhance 3,400 acres of important coastal wetland and prairie habitats.
2005180597	Rehabilitate eroded East Unit reservoir levees and	Rehabilitate eroded East Unit reservoir levees and water control structures. Replace inoperable structures, slope and crown levees, rehabilitate pump station, and control exotic Chinese tallow trees. This infrastructure facilitates manipulation of water levels to enhance migratory bird habitat in this 200-acre freshwater impoundment. This wetland also supports numerous resident fish and wildlife species.
2005180785	Replace eroded Middleton Tract water control structures	Replace eroded Middleton Tract water control structures along East Bay Bayou by removing existing aluminum structures and installing new structures. Washouts below and around these structures are threatening their integrity and limiting management capabilities. This project will protect and enhance 3,400 acres of important coastal wetland and prairie habitats.
2005190451	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp.	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp to improve accessibility. The current launch will be expanded and improved to allow two boats to be launched at the same time, install a solar powered light, and modify the dock to make it accessible in variable tide conditions. The current launch is not lighted and visitors have damaged supports while launching at night.
2005191199	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp.	Rehabilitate the Oyster Bayou (Boat Canal) boat ramp to improve accessibility. The current launch will be expanded and improved to allow two boats to be launched at the same time, install a solar powered light, and modify the dock to make it accessible in variable tide conditions. The current launch is not lighted and visitors have damaged supports while launching at night.
2005196687	Anahuac FY05 Roads & Parking Lots	
2005197717	Anahuac PE Cross and Westline Roads (RTE 101,102)	Preliminary engineering. Provide planning and design of public use Cross and West Line Roads. This project will include site visits surveying needs and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed roads. These roads are part of East Bay Bayou Tract that was recently opened to the public through a multi-partner project involving several conservation groups, industry, and individuals. This portion of the Refuge provides high quality birding, recreational fishing, and general wildlife observation opportunities.
2005199061	Entrance Road (Rte 10) DM pt1	

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Work Order #	Project Title and Cost	Project Description
2005227452	Rehabilitate damaged erosion control bulkheads.	Rehabilitate damaged erosion control bulkheads on East Galveston Bay shoreline. Loss or damage of these structures has resulted in increased rates of shoreline erosion and associated wetland loss. Damaged structures will be replaced with offshore rock barriers which reduce erosion and restore wetland habitats by facilitating establishment of emergent marsh vegetation.
05139623	Grub and remove old levees on the west side of the	Grub and remove old levees on the west side of the Granberry tract. Rehab bottom levee by removing brush, elevating, grading, sloping and install 3 new water control structures. This project will remove 10,500 of unused levees. The proposed project will facilitate restoration of 205 acres of native coastal prairie and shallow fresh water wetlands in the unit. Planning, design and construction can be accomplished in one year.
05139624	Repair Waterfowl Check Station. \$35,000	Repair roof and wall leak in the Refuge Waterfowl Check Station. Replace water damaged interior ceiling and wall boards, damaged exterior siding, flooring and insulation. Sand and treat flooring. Replace exterior doors and construct new parking area to make facility wheel chair accessible. Treat remaining exterior siding and replace heating and cooling units. Replace information and education displays. Remove exterior skirting and seal bottom of trailer to prevent rodent from entering. These repairs will reduce mold and rodent infestation and make the facility more accessible to the public. This facility is used by thousands of visitors annually. If the facility is not repaired soon rehab cost will significantly increase. Planning, design and construction contracting can be accomplished in one year.
97107411	Repair East Unit concrete storage building. \$68,000	Repair East Unit concrete storage building by replacing doors and repairing concrete frames. Inside storage for equipment is a critical need to prevent deterioration caused by the high moisture and high salt marine environment on the Texas Gulf Coast. The roof of this facility needs to be resurfaced to prevent water damage to equipment stored in the building. The lighting needs to be improved to facilitate safe access to the building and additional storage shelving is needed. Maintaining existing storage facilities will improve the longevity of equipment and result in cost savings.
2005232291	Rehabilitate 3 miles of levees and replace water control structures and culverts. \$131,000	Rehabilitate 3 miles of levees and replace water control structures and culverts. Management capabilities are severely hindered by current state of disrepair. This 150 acre freshwater wetland provides valuable habitat for waterfowl, shorebirds, and wading birds, including important brood-rearing and molting habitat for the resident Mottled Duck.
2005239311	Replace fences on the Gator Marsh, Granberry, and Mitigation Area units. \$70,000	Replace 6 miles of deteriorated fences on the Gator Marsh, Granberry, and Mitigation Area units. Fences require constant repair to remain functional, and conditions could result in a public safety hazard on refuge roads if cattle escape. This project will reduce potential for conflicts with refuge visitors and neighboring landowners, and protect sensitive habitats where grazing is not allowed.
2005239328	Rehabilitate levees and water delivery system to Rail Reservoir Moist Soil Unit. \$71,000	Rehabilitate 26,000 feet of levees and water delivery system to Rail Reservoir Moist Soil Unit by sloping, controlling tallow, and replacing culverts. This infrastructure facilitates water management on this 100-acre freshwater wetland, which in turn creates quality habitat for waterfowl, shorebirds, and wading birds, and for many resident fish and wildlife species.

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Work Order #	Project Title and Cost	Project Description
2005232293	Replace 6 rusted and worn cattle guards. \$31,000	Replace 6 rusted and worn cattle guards that have deteriorated to the point where cows used in the refuge grazing program could exit grazing units onto refuge and county roads, where they pose a significant hazard to motorists. This project will reduce potential for conflicts with refuge visitors, enhance public safety, and protect sensitive habitats where grazing is not allowed.
2005239902	Repair Boat Canal public boat ramp and parking area. \$27,000	Repair Boat Canal public boat ramp and parking area by re-gravelling the ramp runway and parking area, and replacing the concrete boat ramp. This popular public boat ramp provides access to Oyster Bayou and East Galveston Bay for recreational fishing, waterfowl hunting, and wildlife viewing. It serves over 20,000 visitors annually and is used by refuge staff to conduct law enforcement and other operations.
2005232330	Remove old cattle shelters from Jackson/White and Old Anahuac	Remove old cattle shelters from Jackson/White and Old Anahuac by tearing down wooden and sheet metal structures and disposing of materials. These structures are severely deteriorated, no longer function, and pose a safety hazard to staff and refuge permittees. Removal of the cattle shelters will eliminate the safety hazards and enhance the natural resources.
2005232389	Replace deteriorated Refuge entrance sign. \$24,000	Replace deteriorated Refuge entrance sign. The area's harsh marine environment has faded sign, eroded its rock base, and rotted wooden supports. Located on heavily traveled roadway, this highly visible sign is an important milepost which both informs visitors and promotes the refuge.
2005239293	Rehabilitate flood damaged refuge boat canal. \$172,000	Rehabilitate flood damaged refuge boat canal by removing silt, repairing levees, and replacing a 36 inch culvert and water control structure. The boat canal provides access to quality recreational fishing, waterfowl hunting, and wildlife observation for over 10,000 refuge visitors annually and for staff conducting law enforcement and other operations.
2005239317	Rehabilitate 4 miles of Jackson Ditch. \$180,000	Rehabilitate 4 miles of Jackson Ditch by repairing a washout at the water control structure and removing excess silt. Bank erosion and siltation at the water control structure is impairing its function and threatens its stability. Maintenance of this drainage infrastructure will protect over 8,000 acres of coastal wetland habitats.
2005239321	Replace and repair 8 miles of deteriorated fences on the Middleton Tract.	Replace and repair 8 miles of deteriorated fences on the Middleton Tract. Fences require constant repair to remain functional, and conditions could result in a public safety hazard on State Highway 124 if cattle escape. This project will also reduce potential for conflicts with neighboring landowners and protect sensitive habitats where grazing is not allowed.
2005239435	Rehabilitate levees on White-fronted Goose Moist Soil Unit. \$50,000	Rehabilitate levees on White-fronted Goose Moist Soil Unit by sloping, removing tallow trees, and replacing water control structures. This infrastructure facilitates water management on this 200 acre freshwater wetland, which in turn creates quality habitat for wintering waterfowl, shorebirds, and wading birds. These habitats also provide brood-rearing and molting habitat for Mottled Ducks.
2005239441	Replace Middleton Tract boat ramp and dock with new facilities. \$27,000	Replace Middleton Tract boat ramp and dock with new facilities. Severe erosion has destroyed the ramp and the wooden dock is severely deteriorated. This project will enhance visitor safety and improve access to the Middleton Tract for over 2,000 waterfowl hunters annually.

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Work Order #	Project Title and Cost	Project Description
2005239947	Remove old shop and boat storage buildings which will soon be replaced. \$108,000	Remove old shop and boat storage buildings which will soon be replaced. These buildings will need to be removed to facilitate construction of the boat storage building in 2005. The refuge water system is located in the old shop building. It will need to be elevated and protected during demolition and construction. The removal of these buildings will allow the refuge to continue operations that are critical to all aspects of refuge management.
2005239926	Repair bridge access crossing East Bay Bayou by repairing washouts. \$38,046	Repair bridge access crossing East Bay Bayou by repairing washouts. Erosion on both sides of the bridge threatens its integrity, and it has not been signed according to Federal safety standards. It may soon become a safety hazard and could wash out during another significant storm event if not repaired. This bridge is regularly used by staff for operations and law enforcement, and by over 10,000 visitors annually. It is also used as an accessible fishing and nature observation area.
2005239933	Replace restroom facilities on Oyster Bayou and East Bay Boat Ramp. \$57,000	Replace restroom facilities on Oyster Bayou and East Bay Boat Ramp. These facilities are over 25 years-old and are no longer functioning because of damage from tropical storms and excessive wear. Visitors are inconvenienced by the restrooms' closure as they are located in popular recreational, but remote, areas. These facilities will be used by over 20,000 refuge visitors annually.
2005238515	Repair or replace boat rollers on the Middleton Tract. \$27,000	Repair or replace boat rollers on the Middleton Tract to facilitate boat access into hunt units of the refuge. Boat rollers provide access to hunters over levees into waterfowl hunt units of the refuge. Boat rollers facilitate almost a one thousand use days for refuge hunters. Wooden supports galvanized and pvc rollers need to be replaced. The existing rollers need to be extended and winch posts need to be installed to facilitate access during low tide events. Planning, design and construction contracting can be accomplished in one year.
2005239287	Replace washed-out Pace Tract culverts. \$165,000	Replace water control structures and repair wash outs on the Pace Tract. These structures are corroded and erosion has occurred due to repeated flooding. Structures are needed to minimize harmful impacts of salt water intrusion and erosion in adjacent wetlands. Replacing structures will protect and enhance 1,400 acres of important waterfowl habitat.
2005239500	Rehabilitate levees and water control structures on the Otter Pond Unit. \$133,000	Rehabilitate levees and water control structures on the Otter Pond Unit by sloping, controlling exotic Chinese tallow trees, and replacing culverts. This infrastructure facilitates water management on this 40-acre freshwater wetland, which in turn creates high quality habitat for waterfowl, shorebirds, and wading birds, and for resident fish and wildlife. Water control structures in this unit also facilitate water management in the 200 acres Shoveler Pond and 100 acres of freshwater wetlands in previous agricultural fields on the Granberry Tract. If structures are not replaced soon it could impact safe travel on Granberry and Shoveler Pond roads.
2005239511	Repair inoperable windmills in Old Anahuac Unit. \$88,000	Repair inoperable windmills in Old Anahuac Unit by replacing broken parts, cleaning wells, and replacing pumps. Loss of windmills has decreased freshwater supply for the refuge's controlled grazing program and for wetland enhancement projects. This project will benefit management of prairie and wetland habitats on the refuge.

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Work Order #	Project Title and Cost	Project Description
2005239800	Rehabilitate 10 miles of deteriorating Alice Jackson White and Granberry unit roads. \$491,000	Rehabilitate 10 miles of deteriorating Alice Jackson White and Granberry unit roads by restoring and crowning roadbeds, cleaning road ditches, and replacing culverts. These roads provide management access to water control structures, grazing units, and prairie restoration sites. Maintenance will increase the longevity of these roads and provide cost savings by preventing the need for major repairs.
2005239812	Rehabilitate Old Anahuac pump station by replacing pump and repairing support infrastructure. \$66,000	Rehabilitate Old Anahuac pump station by replacing pump and repairing support infrastructure. The existing pump requires constant repairs, and the supports have excessive rust and wear. This equipment supplies water to the Oyster Bayou Moist Soil Unit, which is the site of a partnership project with Ducks Unlimited. This 400-acre wetland provides excellent habitat for waterfowl and other migratory birds.
2005239504	Rehabilitate levees on Whimbrel Rice Management Unit. \$30,000	Rehabilitate levees on Whimbrel Rice Management Unit by sloping, controlling tallow, and replacing culverts. This infrastructure facilitates fall and winter flooding of this unit, creating high quality habitat for waterfowl, shorebirds, and wading birds. This project has high partnership potential with Ducks Unlimited and other conservation groups.
2005252497	Repair deteriorated East Unit reservoir road. \$84,000	Repair deteriorated East Unit reservoir road (Property #0273) by restoring the roadbed, crowning and re-gravel surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.
2005252512	Replace Lone Tree Bayou bridge/water control structure. \$104,000	Replace Lone Tree Bayou bridge/water control structure (Property #0087). Erosion on both sides of this structure threatens its integrity. The bridge will become a safety hazard if erosion continues. Bridge provides staff access for law enforcement, fire management, and habitat management activities. Water control structure protects 2,100 acres of coastal wetlands.
2005252522	Replace deteriorated boat and vehicle storage building. \$460,000	Replace deteriorated boat and vehicle storage building. This 1,250 square foot, 35-year old building has rusted structural supports, has a leaky roof, and is rodent infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture and high salt environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in cost savings.
2005252523	Remove abandoned buildings, trailers, equipment and trash. \$53,000	Remove abandoned buildings, trailers, equipment and trash from the Middleton Tract. These materials were left when this tract was acquired in 1995 and pose a threat to public safety. The Middleton Tract is part of the refuge public waterfowl hunting program. The project will remove this hazard, any threat of pollution, and enhance aesthetics.
2005252525	Rehabilitate levees and water control structures. 100,000	Rehabilitate levees and water control structures on Water Moccasin Pond by sloping, controlling exotic Chinese tallow trees, and replacing culverts. This infrastructure facilitates water management on this 100-acre freshwater wetland, which in turn creates quality habitat for waterfowl, shorebirds, and wading birds, and for many resident fish and wildlife species.
2005252530	Repair bridge near Boat Canal by repairing washouts. \$84,000	Erosion on both sides of this structure threatens its integrity will become a safety hazard if it continues. Bridge provides access for law enforcement, fire management, and habitat management activities. Water control structure protects 6,500 acres of coastal wetlands.

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Work Order #	Project Title and Cost	Project Description
2005252532	Replace damaged East Unit 4,000 square foot metal storage building. \$450,000	Replace damaged East Unit 4,000 square foot metal storage building which is 20-years-old, has a leaky roof, is rusted and rodent-infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture/high salt marine environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in significant cost savings.
2005252526	Rehabilitate Robert's Mueller spoil area levee. \$117,000	Rehabilitate Robert's Mueller spoil area levee which is severely eroded and nonfunctional by repairing washouts, resloping and crowning the levee, and removing Chinese tallow trees. This project will restore a 25-acre wetland and allow the reestablishment of a colonial nesting water bird rookery.
2005252552	Replace Lone Tree Bayou bridge/water control structure. \$104,000	Replace Lone Tree Bayou bridge/water control structure (Property #0087). Erosion on both sides of this structure threatens its integrity. The bridge will become a safety hazard if erosion continues. Bridge provides staff access for law enforcement, fire management, and habitat management activities. Water control structure protects 2,100 acres of coastal wetlands.
2005252547	Repair deteriorated East Unit reservoir road. \$84,000	Repair deteriorated East Unit reservoir road (Property #0273) by restoring the roadbed, crowning and re-gravel surface, and cleaning road ditches. This road provides access to the popular East Unit public waterfowl hunting area, which serves over 6,000 hunters annually. This project will increase safety, and provide long-term cost savings by preventing additional deterioration.
2005252310	Replace deteriorated boat and vehicle storage building. \$460,000	Replace deteriorated boat and vehicle storage building. This 1,250 square foot, 35-year old building has rusted structural supports, has a leaky roof, and is rodent infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture and high salt environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in cost savings.
2005252323	Repair East Bay boat ramp parking area. \$28,000	Repair East Bay boat ramp parking area by restoring base and re-gravelling surface. This parking area has been damaged by flooding and heavy use. Visitors been stuck and vehicles damaged in the parking area increasing the risk for injury. A smoother surface also makes the parking area usable to visitors in wheelchairs. It receives year-round use by over 25,000 visitors annually. The boat ramp is also used by law enforcement agencies during emergencies. The refuge's East Bay boat ramp provides the only public access to the north side of East Galveston Bay.
2005252329	Rehabilitate levees and water control structures. 100,000	Rehabilitate levees and water control structures on Water Moccasin Pond by sloping, controlling exotic Chinese tallow trees, and replacing culverts. This infrastructure facilitates water management on this 100-acre freshwater wetland, which in turn creates quality habitat for waterfowl, shorebirds, and wading birds, and for many resident fish and wildlife species.
2005252316	Remove abandoned buildings, trailers, equipment and trash. \$53,000	Remove abandoned buildings, trailers, equipment and trash from the Middleton Tract. These materials were left when this tract was acquired in 1995 and pose a threat to public safety. The Middleton Tract is part of the refuge public waterfowl hunting program. The project will remove this hazard, any threat of pollution, and enhance aesthetics.
2005252317	Replace foot bridge to East Unit reservoir. \$53,000	Replace foot bridge to East Unit reservoir. This bridge was completely destroyed by flooding and is closed. Replacement will improve access to the reservoirs on the popular East Unit public waterfowl hunt area, which serves over 6,000 hunters annually.

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Work Order #	Project Title and Cost	Project Description
2005252330	Remove levees, canals and ditch spoil. \$135,000	Remove levees, canals and ditch spoil adjacent to Middleton Tract rice fields. This tract is no longer farmed, and levees, canals and spoil interrupt sheet flows to important marsh and prairie habitats. This project will remove infrastructure which is no longer needed, restore natural hydrology and facilitate resource protection and habitat restoration of rare native prairie grasses on over 250 acres.
2005252336	Rehabilitate Robert's Mueller spoil area levee. \$117,000	Rehabilitate Robert's Mueller spoil area levee which is severely eroded and nonfunctional by repairing washouts, resloping and crowning the levee, and removing Chinese tallow trees. This project will restore a 25-acre wetland and allow the reestablishment of a colonial nesting water bird rookery.
2005252337	Rehabilitate Robert's Mueller spoil area levee. \$117,000	Rehabilitate Robert's Mueller spoil area levee which is severely eroded and nonfunctional by repairing washouts, resloping and crowning the levee, and removing Chinese tallow trees. This project will restore a 25-acre wetland and allow the reestablishment of a colonial nesting water bird rookery.
2005252343	Repair bridge near Boat Canal by repairing washouts. \$84,000	Repair bridge near Boat Canal by repairing washouts. Erosion on both sides of this structure threatens its integrity will become a safety hazard if it continues. Bridge provides access for law enforcement, fire management, and habitat management activities. Water control structure protects 6,500 acres of coastal wetlands.
2005252351	Replace damaged East Unit 4,000 square foot metal storage building. \$450,000	Replace damaged East Unit 4,000 square foot metal storage building which is 20-years-old, has a leaky roof, is rusted and rodent-infested. Inside storage for equipment is a critical need to prevent deterioration caused by high moisture/high salt marine environment on the Texas Gulf Coast. Adequate storage facilities will improve longevity of equipment and result in significant cost savings.
2005252352	Replace deteriorated waterfowl hunter foot bridges. \$47,000	Replace deteriorated waterfowl hunter foot bridges. These wooden bridges have deteriorated due to the harsh marine environment. Structural soundness is questionable, posing safety risks to the public and staff. This project will enhance public safety and visitor services on the popular East Unit public waterfowl hunting area, which serves 6,000 users annually. It has high partnering potential.
2005255880	Cross and Westline Roads (RTE 101,102)	Preliminary engineering. Provide planning and design of public use Cross and West Line Roads. This project will include site visits surveying needs and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed roads. These roads are part of East Bay Bayou Tract that was recently opened to the public through a multi-partner project involving several conservation groups, industry, and individuals. This portion of the Refuge provides high quality birding, recreational fishing, and general wildlife observation opportunities.
2005260709	Large Rehabilitate East Bay bayou Tract roads and parking areas. \$403,000	Rehabilitate East Bay bayou Tract roads and parking areas to improve access and make roads safer for visitors. Expand the current one lane road to a two lane gravel road. Elevate and resurface parking areas and lower portions of road. Existing ditches and levees will need to be moved to facilitate road width expansion. The current road requires visitors to pull over on a very steep slope to allow cars to pass each other. Larger vehicles can not pull over far enough to allow opposing traffic to pass. This tract of the refuge facilitates tens of thousands visitors annually. It is within one hours drive of over five million people including Houston, Texas the fourth largest city in the nation. This project will require more than one year to design, plan and complete construction contracting.

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Work Order #	Project Title and Cost	Project Description
2006394477	Rehabilitate 10 miles of deteriorating Alice Jackson White and Granberry unit roads. \$491,000	Rehabilitate 10 miles of deteriorating Alice Jackson White and Granberry unit roads by restoring and crowning roadbeds, cleaning road ditches, and replacing culverts. These roads provide management access to water control structures, grazing units, and prairie restoration sites. Maintenance will increase the longevity of these roads and provide cost savings by preventing the need for major repairs.
2006394516	Repair bridge access crossing East Bay Bayou by repairing washouts. \$38,046	Repair bridge access crossing East Bay Bayou by repairing washouts. Erosion on both sides of the bridge threatens its integrity, and it has not been signed according to Federal safety standards. It may soon become a safety hazard and could wash out during another significant storm event if not repaired. This bridge is regularly used by staff for operations and law enforcement, and by over 10,000 visitors annually. It is also used as an accessible fishing and nature observation area.
2006506112	Rehabilitate boat canal banks with shoreline protection. \$429,000	Rehabilitate the boat canal banks with shoreline protection. The boat canal banks have experienced significant erosion from boat wakes. Erosion has increased the size of the boat canal by five feet. The banks are threatening to erode into the adjacent property owners land. Canal banks will be sloped and armored with cable block and felt. This canal provides boat access to refuge and state waters for tens of thousands of fishermen, hunters and nature enthusiasts annually.
2006508097	Windmill Rd & parking (Rte 11, 6.7 mi) \$ 2382,000	Construction. Repair 9 miles of roads and parking areas in the Old Anahuac Unit from the shop to Frozen Point (Windmill Road). Project will include restoring and crowning roadbeds, re-graveling and cleaning road ditches. These roads provide recreational opportunities for over 60,000 visitors annually and provide the only public access to the north side of East Galveston Bay.
2006506142	Rehabilitate the tan equipment storage building (Red Wolf). \$115,000	Rehabilitate the tan (Red Wolf) equipment storage building to protect refuge equipment. Portion of the existing floor needs to be covered with concrete, additional lighting is needed, several doors need to be repaired to properly secure the building and make it safe for staff entry during night time hours. Industrial shelving is needed to protect and properly store specific refuge equipment.
2006506810	Replace 18' Wooden Water Control Structure (Salt Barrier), East Unit. \$95,000	Replace the 18-foot wooden water control structure on the East Bay Bayou Tract located on the East Unit. The structure serves as a saltwater barrier to reduce movement of salt water through a major drainage ditch to fresh water wetlands upstream. The structure has been damaged by flooding and marine burrowing worms. The structure was temporarily repaired in FY2000 however will soon fail again. Replacement of this structure is critical to facilitating protection and management of over 1800 acres of fresh and intermediate marsh.
2006506230	Rehabilitate East Bay Bayou walking trail. \$68,000	Rehabilitate the East Bay Bayou walking trail to improve visitor use and experiences. Improvements of this trail are sure to allow more visitors to appreciate wildlife resources on the refuge. The existing trail system needs to be crowned and resurfaced with rock to improve walking conditions. Existing culverts need to be replaced and additional culverts installed to reduce flooding, erosion and the tripping hazards along portions of the trail. Directional and interpretive signs will be installed to direct visitors along the trail.

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Work Order #	Project Title and Cost	Project Description
2006506248	Replace the New Ditch water control structure. \$144,000	Replace the New Ditch water control structure and bulkheads. The current structure is insufficient for the water shed that it supports. This structure makes it possible to manage water levels, salinities and water quality in 6,500 acres of the Deep Marsh Unit. This marsh supports hundreds of thousands of waterfowl use days annually and is important habitat for wading birds, shorebirds and other marsh wildlife. Species of conservation concern which will benefit from the replacement of this structure include White Ibis, American Bittern, Northern Harrier, Yellow and Black Rails, Whimbrel, Long-billed Curlew, Hudsonian Godwit, Stilt Sandpiper, Short-billed Dowitcher and Seaside Sparrows. The structure will be relocated and replaced with a larger aluminum box culvert with vinyl bulkheads. Planning and design is underway and the construction can be completed in one year.
2006508257	Repair Waterfowl Check Station. \$35,000	Repair roof and wall leak in the Refuge Waterfowl Check Station. Replace water damaged interior ceiling and wall boards, damaged exterior siding, flooring and insulation. Sand and treat flooring. Replace exterior doors and construct new parking area to make facility wheel chair accessible. Treat remaining exterior siding and replace heating and cooling units. Replace information and education displays. Remove exterior skirting and seal bottom of trailer to prevent rodent from entering. These repairs will reduce mold and rodent infestation and make the facility more accessible to the public. This facility is used by thousands of visitors annually. If the facility is not repaired soon rehab cost will significantly increase. Planning, design and construction contracting can be accomplished in one year.
2006508131	Cross & West Line Rds (Rte 101, 102; 3 mi) \$658,000	Repair 2.2 miles of East Bay Bayou Tract roads and parking areas by restoring and crowning roadbeds, re-gravelling surfaces and cleaning road ditches. This area provides recreational opportunities for over 25,000 visitors annually. This tract was recently opened to the public through a multi-partner project involving several conservation groups, industry, and individuals. This portion of the Refuge provides high quality birding, recreational fishing, and general wildlife observation opportunities.
2006508260	Repair Waterfowl Check Station. \$35,000	Repair roof and wall leak in the Refuge Waterfowl Check Station. Replace water damaged interior ceiling and wall boards, damaged exterior siding, flooring and insulation. Sand and treat flooring. Replace exterior doors and construct new parking area to make facility wheel chair accessible. Treat remaining exterior siding and replace heating and cooling units. Replace information and education displays. Remove exterior skirting and seal bottom of trailer to prevent rodent from entering. These repairs will reduce mold and rodent infestation and make the facility more accessible to the public. This facility is used by thousands of visitors annually. If the facility is not repaired soon rehab cost will significantly increase. Planning, design and construction contracting can be accomplished in one year.
2006508264	Repair East Unit concrete storage building. \$68,000	Replace doors and repair concrete frames. Storage for equipment prevents deterioration caused by the high moisture and high salt marine environment on the Texas Gulf Coast. The roof needs to be resurfaced to prevent water damage to equipment stored inside. The lighting needs to be improved to facilitate safe access to the building and additional storage shelving is needed. Maintaining existing storage facilities will improve the longevity of equipment and result in cost savings.

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Work Order #	Project Title and Cost	Project Description
2006508143	Boat Ramp Rd (Rte 100, 0.24mi) \$55,000	Construction. Rehabilitate Boat Ramp Road by restoring and crowning roadbed, re-gravel surface and cleaning road ditches. This road provides access to the popular Boat Canal public boat ramp, which provides access to Oyster Bayou and East Galveston Bay for fishing, waterfowl hunting and wildlife viewing.
2006507394	Repair East Unit farm roads. \$1191,000	Repair East Unit farm roads by restoring and crowning roadbed and cleaning road ditches. These roads provide access for rice farming and moist soil management, two practices aimed at providing high quality habitat for wintering waterfowl and for public waterfowl hunting. Maintenance will increase the longevity of these roads, and provide cost-savings by preventing the need for major repairs.
2006507977	Oyster Bayou Rd (Rte 103, 2.1 mi) \$1094,000	Construction. Rebuild and re-gravel 4 miles of Oyster Bayou Road. This road is currently closed to the public due to its deteriorated condition. Reopening this road will provide recreational opportunities for over 20,000 visitors annually.
2006508158	Remove old levees and rehab main levee in Granberry Tract. \$167,000	Grub and remove old levees on the west side of the Granberry tract. Rehab bottom levee by removing brush, elevating, grading, sloping and install 3 new water control structures. This project will remove 10,500 of unused levees. The proposed project will facilitate restoration of 205 acres of native coastal prairie and shallow fresh water wetlands in the unit. Planning, design and construction can be accomplished in one year.
2006534266	Rehabilitate Elm and East Bay Bayou Levees. \$478,000	Rehabilitate Elm and East Bay Bayou Levees (Middleton). Clear, slope and elevate levees on Elm and East Bay Bayou on the Middleton Tract. Protect and bulkhead the saltwater barrier attached to the Elm Bayou levee. This levee system protects and facilitates the management of over 3,500 acres of fresh and intermediate marsh on the refuge and protects 1000s of acres of private land from salt water intrusion. Significant erosion occurred near the salt water barrier and reduced the elevation in key areas of the levee.
2006534271	Rehabilitate Elm and East Bay Bayou Levees. \$478,000	Rehabilitate Elm and East Bay Bayou Levees (Middleton). Clear, slope and elevate levees on Elm and East Bay Bayou on the Middleton Tract. Protect and bulkhead the saltwater barrier attached to the Elm Bayou levee. This levee system protects and facilitates the management of over 3,500 acres of fresh and intermediate marsh on the refuge and protects 1000s of acres of private land from salt water intrusion. Significant erosion occurred near the salt water barrier and reduced the elevation in key areas of the levee.
2006535293	Remove abandoned oil pads in Gator Marsh (LJH). \$47,000	Remove abandoned oil pads in Gator Marsh (LJH) and the 480 units. Pads remain after production ceased. These well pads were present when the refuge purchased these units. We propose to create shallow fresh water wetlands from pad spoil. The wetlands will provide pair pond habitat for declining Mottled Duck populations while removing unwanted infrastructure from valuable wetland habitat. Planning, design and construction contracting can be completed in one year.

DEFERRED MAINTENANCE MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
04135352	Rehabilitate old shop building. \$223,000	Rehabilitate old shop building to make it weather proof and provide a safe and secure facility to maintain and store refuge heavy equipment. Original metal building was erected in 1981, and has been subjected to salt air, wind, and storms. Roof and sides leak, and roll up doors need maintenance. Steel frame is still sound, however, siding and roof are full of holes, and electricity is sporadic. Rehab could be accomplished in one year.
04135353	Replace Shop building constructed in 2000. \$300,000	Replace Shop building to ensure that refuge maintenance facilities remain safe for maintenance staff and for storing equipment. This wood framed building with metal siding was constructed in 2000 but has taken a beating over the years in this harsh environment of salt air, hurricanes, and violent thunderstorms. This is the primary building for maintenance of refuge heavy equipment, and it houses the maintenance crew offices. It may take 2 years to plan and construct a new shop.
04134683	Repair and stabilize eroded south Gulf Intracoastal Water Way levee. \$550,000	Repair and stabilize the highly eroded south Gulf Intercoastal Water Way levee from Clam Lake Road to 1.5 miles west. The access road to Star Lake, which is heavily used for public recreation access, is being threatened by erosion. Wakes from tugboats, barges, and other water craft have undercut and eroded most of the levee. Rock breakwaters will be constructed in front of the bank to protect it from wave action.
03126426	Repair eroded segment of south GIWW levee, east of White's levee. \$540,000	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee east of White's Levee. Wakes from large barges and other water craft have undercut and eroded most of the levee. This project will protect the refuge's Central Unit from saltwater intrusion which would degrade this area's freshwater marshes. This unit contains over 8,000 acres of wetlands and supports over 100,000 wintering waterfowl annually.
03126425	Repair, stabilize, and armor levee on North Unit. \$437,000	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the North Unit. Wakes from large barges and other water craft have caused the bank to be undercut and erode away most of the levee. This project will protect the refuge's North Unit from saltwater intrusion which would degrade this area's freshwater marsh. This unit contains 8,000 acres supporting over 100,000 wintering waterfowl annually.
03126576	Repair, stabilize and armor highly eroded earthen	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the Star Lake Road Stretch. Wakes from large barges and other water craft have undercut and eroded most of the levee and threaten the road. This project will protect the refuge's Five Mile Cut Unit which would degrade this area's freshwater wetland habitat. This project would also protect the only access road to the most heavily used unit by the public. This unit has about 4,000 acres of wetlands, and supports over 100,000 wintering waterfowl annually.
03126585	Rehabilitate Eroded E Ditch. \$34,000	Rehabilitate eroded E Ditch. The ditch is silted in and grown over, making the canal impassable and creating a navigational hazard. The project will eliminate silt buildup in the ditch. The ditch canal provides the only possible access to waterfowl hunting areas by the public using boats. If ditches are not maintained, hunters will not be able to access areas for hunting. In addition, silted-in stretches of ditch, can strand boats or cause accidents creating unsafe situations.

DEFERRED MAINTENANCE MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
03126698	Rehabilitate eroded White's levee. \$141,000	This project would repair the eroded White's Levee. This levee has eroded due to storm surges and subsidence. This 3.5 mile levee is critical for water management of 15,000 acres of wetlands. These wetlands support over 100,000 wintering waterfowl and numerous other wildlife species. This levee also provides access for recreational waterfowl hunters.
03126705	Repair eroded spillways along North bank of Gulf Intracoastal Waterway. \$220,000	Repair eroded spillways along North bank of Gulf Intracoastal Waterway to protect large freshwater marsh from saltwater intrusion. The 2 spillways allow freshwater to drain from the marsh while keeping saltwater out. Erosive tugboat and barge wakes have eroded the dirt bank around the ends of the spillways threatening to allow saltwater into the marsh. Project would rebuild the bankline and place riprap or concrete mats on the bank to stop the erosion. Loss of the use of these spillways would eliminate our ability to manage the area as a freshwater marsh. Planning, design, and construction contracting can be accomplished in one year.
03126409	Repair North Unit's GIWW levee. \$500,000	Repair North Unit's levee, west 1 mile section. Stabilize and armor highly eroded earthen Gulf Intracoastal Waterway levee along the North Unit. Waves from large barges and other water craft have caused banks to be undercut and erode most of the levee. This project will protect the refuge's north unit from saltwater intrusion, which would degrade this area's fresh marshes. This unit contains over 8,000 acres supporting over 100,000 wintering waterfowl and other species of concern.
03124386	Reservoir Road (Rte 100). \$125,000	Construction and rehabilitation of Reservoir Road (Rte 100, 0.5 mi). The project is needed to provide improved public access for refuge visitors and to reduce safety hazards. FHWA included the road in the 2001 inventory and condition assessment.
03124387	Ring Levee Road (Rte 200) and parking lot (904). \$334,000	Construction and rehabilitation of Ring Levee Road (Rte 200, 0.7 mi) and parking lot 904. The project is needed to provide improved public access for refuge visitors and to reduce safety hazards. FHWA included the road in the 2001 inventory and condition assessment.
02122012	Clam Lake Road (RTE 10)	Preliminary Engineering. Provide planning and design of public use Clam Lake Road at NWR. This project will include site visits surveying needs and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed road and parking lots at NWR.
01115492	Rehabilitate Wild Cow Bayou Levee. \$206,000	Rehabilitate approximately 5 miles of levee that has deteriorated. This levee impounds water within a 5,600 acre freshwater wetland management unit. It also serves a barrier to saltwater. Due to a lack of maintenance and storm events, the levee has developed numerous breaches that allow saltwater to enter the impoundment. As a consequence, 5,600 acres of valuable freshwater wetland habitat is in jeopardy of becoming highly fragmented, resulting in significant loss of valuable fish and wildlife habitat.
01115458	Rehabilitate and retrofit old and deteriorating office building. \$380,000	Rehabilitate and expand the existing administrative building. The building has experienced significant deterioration that has been accelerated due to the influence of saltwater. The electrical system, roof, and siding need to be replaced. This 1,694 square foot building provides office space for seven staff members. Due to insufficient space, staff members are forced to share offices. Storage space for administrative files and refuge equipment is insufficient. The buildings present conditions present numerous health and safety hazards.

DEFERRED MAINTENANCE MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
01115499	Rehabilitate the one-mile Grit Site Road. \$47,000	This is an earthen levee road that has eroded. Levee will be enhanced & road will be reshaped. This road is the only means for access to the station's grit site, which is vital for wintering waterfowl.
01115485	Rehabilitate Ring Levee Road. \$42,000	Rehabilitate the one mile length of Ring Levee Road on NWR. The road has not been resurfaced for more than ten years. Due to the lack of gravel, the road has become rutted and pothole. The road is heavily utilized for refuge management purposes and also critical for operation of oil facility inholdings. Funding will be used to purchase gravel necessary to adequately repair this road.
01115474	Replace two deteriorated aluminum culverts. \$80,000	Replace two deteriorated aluminum culverts located within Perkin's levee. The culverts have rusted through and are about to collapse. A service road crosses these culverts, and when they collapse, it will result in the closure of 2.5 miles of administrative road. This road is critical to refuge operations. The culverts also provide for water level manipulation within a 16,000 acre wetland impoundment. Without these culverts water levels will no longer be able to be effectively manipulated in this impoundment, which will result in the degradation of 16,000 acres of valuable wildlife habitat.
01115477	Rehabilitate Reservoir Road. \$45,000	Repair and reshape one mile of existing public use road that is used year around by the public for fishing and bird watching. The road provides the only access to significant portions of the station's land that are available for public hunting. This road has deteriorated and needs additional gravel and reshaping. This project will provide funding necessary to contract work and purchase gravel.
01115480	8.8 miles Clam Lake Road (Rte 10)	Construction and rehabilitation of Clam Lake Road (Rte 010, 8.8 mi). The project is needed to provide improved public access for refuge visitors and to reduce safety hazards. This road provides the primary means for accessing NWR by the public. It is heavily utilized and has not been rehabilitated for almost ten years. The road holds surface water and as a result has significant rutting and potholes. It provides the only means for hunters to access approximately 15,000 acres of refuge land that are open to hunting. The present condition of this road results in damages to motor vehicles.
97107459	Headquarters, Star Lake, Levee 6/7 Route 11,101,102 parking lots 905,906.	CN Headquarters, Star Lake, Levee 6/7 Route 11,101,102 parking lots 905,906 Regrade and regravell .6 of a mile.
99107500	Rehabilitate eroded F Ditch Canal. \$29,000	Rehabilitate eroded F Ditch Canal. The canal is silted in and grown over, making the canal impassable and creating navigation hazards. Project will eliminate silt from the canal. This ditch canal provides boating access for the public to a remote portion of the refuge's permit waterfowl hunt area.
97107431	Replace boundary fence on western units of NWR. \$156,000	Replace 3 miles of refuge boundary fence on western units of NWR. Existing fences have been damaged during storms and through vandalism, and are subject to a corrosive environment. These fences mark the refuge boundaries, control trespass and damage of sensitive habitats, and designate pastures used in the refuge's rotational grazing program. Project includes signing and surveying where needed.

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Work Order #	Project Title and Cost	Project Description
96107432	Rehabilitate overgrown, silted-in boat canals in the White Unit. \$43,000	Rehabilitate overgrown, silted-in boat canals in the White Unit to allow boating access for the refuge waterfowl hunt program. Ditches are silted in and overgrown with vegetation, posing navigational hazards. Hunters whose boats become hung up in the canals can be stranded for extended periods.
98107490	Remove Pond 6 Oil Field Levee. \$52,000	Remove old oil field infrastructures including levees from Pond 6 . The oil field is not active and structures need removal to return the marsh to original habitat conditions. Removal will involve potentially contaminated well pads. This project will provide the ability to effectively manage habitat resources.
91107433	Replace damaged original refuge boundary fences. \$365,000	Replace worn boundary fences on the original refuge. These fences have been damaged by storm surge and the corrosive marine environment and by vandalism. These fences are essential to manage cattle in support of the grazing management program which promotes food resources for waterfowl. Trespassing cattle are detrimental to this management program and are a hazard to visitors using the refuge.
91107426	Replace waterfowl hunt check station. \$29,000	Replace waterfowl hunt check station. The check station is a very old 10 X 25 ft. prefabricated building. This facility is used to implement a permit reservation system, for hunter check-in and check-out, to provide information and education, and for collection of biological data and specimens for study. The check station serves over two thousand hunters annually. The building is not sufficient in size to adequately administer the station's hunt program. There are numerous health and safety issues, including: faulty wiring that poses a fire hazard, no heat or AC, no insulation, leaky walls and roof, numerous access points for spiders, roaches, mice and rats. The building would be replaced with a similar sized, prefabricated building with electricity, water, and a data collection area.
98107427	Repair North Unit Gulf Intracoastal Waterway levee. \$475,000	Repair and stabilize eroding North Unit Gulf Intracoastal Waterway levee starting from the east boundary and working West. This levee is quickly eroding from wake action generated by barge traffic. Low areas of the levee that have already eroded through will be rebuilt with material obtained onsite. The Intracoastal Waterway bankline will then be stabilized by building a rock breakwater on the shallow water shelf within the GIWW. Because of access problems, all the work will be performed from a barge in the Intracoastal Waterway. Refuge lands located on the south bank of the Intracoastal Waterway have been protected from erosion in this way and it has been successful.
98107428	Repair, stabilize and armor earthen Intracoastal Waterway Levee. \$503,000	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the Wild Cow Bayou reach of the South Unit north of Pond 7. Wakes from large barges and other water craft have undercut and eroded most of the levee. This project will protect the refuge's Wild Cow Bayou Marsh Unit from saltwater intrusion, which would degrade this area's fresh marshes. This unit contains over 5,000 wetland acres supporting over 100,000 wintering waterfowl annually.
95107429	Rehabilitate LeBlanc's Reservoir levees. \$221,000	Rehabilitate LeBlanc's Reservoir levees. These levees have eroded from storms, flooding, and damage from alligators. The levees are breached in numerous places and water management capabilities have been lost. As a result, high quality aquatic plant production has been lost, resulting in a reduction in the availability of quality wintering habitat for numerous waterfowl and wading birds. This project will reestablish levees of this freshwater impoundment which will allow salinity levels to be reduced.

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Work Order #	Project Title and Cost	Project Description
91107437	Rehabilitate Perkins Levee. \$90,000	Levee has been subject to erosion from storm surge tides, rain, and damaged by feral hogs and alligators. This levee prevents saltwater intrusion and degradation of emergent coastal marshes in the 15,000-acre Star Lake Unit. This unit receives heavy use by wintering waterfowl. Perkins Levee also provides management access for staff and public access for waterfowl hunting.
97107434	Repair vehicular bridge at Star Lake. \$29,000	Repair vehicular bridge at Star Lake, including approach rails, signing, and reflectors, as per bridge safety report inspections. This bridge is used by refuge staff, the public, and inholding owners or leasers to access Star Lake and the central portion of the refuge.
95107435	Repair deficient headquarters parking area. \$31,000	Rehabilitate headquarters parking area by adding gravel and repairing barriers. This parking area includes a repoured concrete area that doubles as a helicopter pad for fire operations. The parking area is used by refuge staff and visitors. It is also the primary parking site for waterfowl hunters using the Permit hunt unit.
99107442	Replace worn automatic entrance gate. \$48,000	Replace the front entrance gate at with new model. Gate is 200 yards from the gulf, and salt air and spray erodes metal and electronic security gate. Automatic timer opens and closes the refuge entrance at daylight and dark, providing essential security and safety for the refuge and resident staff after hours. Programmable function is vital for hunt program openings at 3:00 am.
98107491	Remove abandon infrastructure from West oil field. \$55,000	The oil field is not active and structures need removal to return the marsh to original conditions. May contain contaminated well pads. Removal of abandon infrastructure will allow proper management of the resources once original conditions are returned to the marsh.
98107492	Remove abandoned Clam Lake Oil Field infrastructure. \$50,000	Remove abandoned Clam Lake Oil Field infrastructure and restore the marsh. Project area is adjacent to Pond 7 and east of 6/7 levee and north of Reservoir Road. Includes levees, ditches, and potentially contaminated well pads. Removal of the oil field infrastructure will allow marsh habitat to be restored and aid in resource management.
2005159380	Repair S. GIWW Levee - Star Lake East \$450,000 McFaddin	Repair, stabilize and armor highly eroded earthen Intracoastal Waterway Levee along the Star Lake Road Stretch. Wakes from large barges and other water craft have undercut and eroded most of the levee and threaten the road. This project will protect the refuge's Five Mile Cut Unit which would degrade this area's freshwater wetland habitat. This project would also protect the only access road to the most heavily used unit by the public. This unit has about 4,000 acres of wetlands, and supports over 100,000 wintering waterfowl annually. This project has high partnership potential with the Texas General Land Office through the Texas Coastal Erosion Planning and Response Act Program.
2005170816	Repair eroded segment of South GIWW Levee East	
2005176653	Rehabilitate 8.8 miles of Clam Lake Road Route 010	The project is needed to provide improved public access for refuge visitors and to reduce safety hazards. This road provides the primary means for accessing NWR by the public. It is heavily utilized and has not been rehabilitated for almost ten years. The road holds surface water and as a result has significant rutting and potholes. It provides the only means for hunters to access approximately 15,000 acres of refuge land that are open to hunting. The present condition of this road results in damages to motor vehicles.

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Work Order #	Project Title and Cost	Project Description
2005176656	Regrade and Regravel CN Headquarters, Star Lake, Levee 6/7 Route 11,101	CN Headquarters, Star Lake, Levee 6/7 Route 11,101,102 parking lots 905,906 Regrade and regravel .6 of a mile.
2005177564	Remove old oil field infrastructures	Remove old oil field infrastructures including levees from Pond 6 . The oil field is not active and structures need removal to return the marsh to original habitat conditions. Removal will involve potentially contaminated well pads. This project will aid in effectively managing habitat resources.
2005178360	Repair and stabilize eroded south Gulf Intracoastal Water Way levee	Repair and stabilize the highly eroded south Gulf Intracoastal Water Way levee from Clam Lake Road to 1.5 miles west. The access road to Star Lake, which is heavily used for public recreation access, is being threatened by erosion. Wakes from tugboats, barges, and other water craft have undercut and eroded most of the levee. Rock breakwaters will be constructed in front of the bank to protect it from wave action.
2005178082	Remove abandoned Clam Lake Oil Field infrastructure	Remove abandoned Clam Lake Oil Field infrastructure and restore the marsh. Project area is adjacent to Pond 7 and east of 6/7 levee and north of Reservoir Road. Includes levees, ditches, and potentially contaminated well pads. Removal of the oil field infrastructure will allow marsh habitat to be restored and aid in resource management.
2005180788	Rehabilitate eroded F Ditch Canal.	Rehabilitate eroded F Ditch Canal. The canal is silted in and grown over, making the canal impassable and creating navigation hazards. Project will eliminate silt from the canal. This ditch canal provides boating access for the public to a remote portion of the refuge's permit waterfowl hunt area.
2005180365	Repair, stabilize, and armor levee on North Unit	Repair earthen Intracoastal Waterway Levee along the North Unit. Wakes from large barges and other watercraft have caused the bank to be undercut and erode away most of the levee. This project will protect the refuge's North Unit from saltwater intrusion which would degrade this area's freshwater marsh. This unit contains 8,000 acres supporting over 100,000 wintering waterfowl annually.
2005184120	Refuge Rds & Parking Lots	
2005185603	PE Clam Lake Road (RTE 10)	Preliminary Engineering. Provide planning and design of public use Clam Lake Road Route 10 at NWR. This project will include site visits, surveying needs, and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed road at NWR.
2005186478	Replace two deteriorated water control structure culverts. \$80,000	Replace two deteriorated aluminum culverts located within Perkin's levee. The culverts have rusted through and are about to collapse. A service road crosses these culverts, and when they collapse, it will result in the closure of 2.5 miles of administrative road. This road is critical to refuge operations. The culverts also provide for water level manipulation within a 16,000 acre wetland impoundment. Without these culverts water levels will no longer be able to be effectively manipulated in this impoundment, which will result in the degradation of 16,000 acres of valuable wildlife habitat.
2005190389	Repair North Unit's GIWW levee, west 1 mile section	Stabilize and armor highly eroded earthen Gulf Intracoastal Waterway levee along the North Unit. Waves from large barges and other water craft have caused banks to be undercut and erode most of the levee. This project will protect the refuge's north unit from saltwater intrusion, which would degrade this area's fresh marshes. This unit contains over 8,000 acres supporting over 100,000 wintering waterfowl and other species of concern.

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Work Order #	Project Title and Cost	Project Description
2005194552	Refuge Rds & Parking Lots	
2005225134	Replace Wild Cow Bayou Water Control Structure. \$78,000	Replace deteriorated Wild Cow Bayou Water Control Structure. Structure is essential for managing water on 5000-acre unit of refuge that has high value for wintering waterfowl. Structure was built in 1991 and has experienced subsidence and erosion from storms. Culverts and flapgates would be replaced. Bulkheads and earthwork would be redone to stop leaking. Area is an important public recreation area also.
2005225138	Replace Wild Cow Bayou Water Control Structure. \$78,000	Replace deteriorated Wild Cow Bayou Water Control Structure. Structure is essential for managing water on 5000-acre unit of refuge that has high value for wintering waterfowl. Structure was built in 1991 and has experienced subsidence and erosion from storms. Culverts and flapgates would be replaced. Bulkheads and earthwork would be redone to stop leaking. Area is an important public recreation area also.
2005227463	Replace waterfowl hunt check station. \$29,000	Replace waterfowl hunt check station. The check station is a very old 10 X 25 ft. prefabricated building. This facility is used to implement a permit reservation system, for hunter check-in and check-out, to provide information and education, and for collection of biological data and specimens for study. The check station serves over two thousand hunters annually. The building is not sufficient in size to adequately administer the station's hunt program. There are numerous health and safety issues, including: faulty wiring that poses a fire hazard, no heat or AC, no insulation, leaky walls and roof, numerous access points for spiders, roaches, mice and rats. The building would be replaced with a similar sized, prefabricated building with electricity, water, and a data collection area.
2005227472	Replace waterfowl hunt check station. \$29,000	Replace waterfowl hunt check station. The check station is a very old 10 X 25 ft. prefabricated building. This facility is used to implement a permit reservation system, for hunter check-in and check-out, to provide information and education, and for collection of biological data and specimens for study. The check station serves over two thousand hunters annually. The building is not sufficient in size to adequately administer the station's hunt program. There are numerous health and safety issues, including: faulty wiring that poses a fire hazard, no heat or AC, no insulation, leaky walls and roof, numerous access points for spiders, roaches, mice and rats. The building would be replaced with a similar sized, prefabricated building with electricity, water, and a data collection area.
05139231	Rehabilitate worn Middleton Levee hunter access trail. \$75,000	Rehabilitate worn Middleton Levee hunter access trail. This levee is used by hunters to walk into the popular Mud Bayou hunt area. It provides important access to hunters without boats. This levee also allows cows to penetrate deeper into the marsh, providing important habitat management benefits. The levee has deteriorated due to storm surges and cattle use. We will contract an amphibious excavator to rebuild this levee.
05139214	Repair deteriorated boat launch (refuge headquarters). \$30,000	This boat launch is critical for management of the 5000-acre Wild Cow Bayou unit of the refuge because it is the only boat launch for this unit. The boat launch is also used by several hundred waterfowl hunters every year to access popular hunting areas. The dock associated with the boat launch is in need of repair also. The dock was built in 1992 and deteriorated over the years. We will rebuild the dock, add gravel to the launch area, and dredge the launch area to make it deeper.

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Work Order #	Project Title and Cost	Project Description
05139241	Rehabilitate eroded B-Ditch in Wild Cow Bayou Unit. \$28,000	Rehabilitate eroded B-Ditch in Wild Cow Bayou Unit. Ditch has silted in and become impassable. Ditch is used by waterfowl hunters to access popular waterfowl hunting area. Ditch is also used by refuge personnel to access area for habitat management. Silt and vegetation will be removed.
05139202	Repair Equipment Storage Building (airboat barn). \$27,000	Repair worn equipment storage building to protect valuable refuge equipment from weather and provide a secure storage area. Refuge airboats, tractors, and bulldozer are stored in this building, which can be locked. Many of the overhead doors are worn and the tracks are coming apart. Most of the doors can not be locked anymore. The condition assessment in 2002 identified these deficiencies. Since then, the roof and walls have developed leaks in several areas because of severe weather. Repair of this facility will facilitate management of 54,000-acre refuge by protecting equipment that is essential for refuge management.
05139205	Repair worn fishing pier at 10-mile cut bridge. \$25,000	Repair worn fishing pier at 10-mile cut bridge. This fishing pier is an extremely popular public use facility used by several hundred people every year for fishing and crabbing. This pier was constructed in 1991 and has experienced deterioration over the years. Many of the nails and screws have rusted off and many boards are loose and broken, which will be a safety hazard to the public if it is not fixed soon. We will replace most of the boards on the deck and rails with new boards. A refurbished fishing pier will serve the public safely for years to come.
05139222	Rehabilitate deteriorated boat launch at the north end of Clam Lake. \$29,000	Rehabilitate deteriorated boat launch at the north end of Clam Lake. This boat launch is used by refuge biologists and law enforcement personnel to access the 5-mile cut area, which is an important waterfowl wintering area, and a popular waterfowl hunting area. The boat launch has experienced erosion around the ramp which makes it hard to launch boats. It has also silted in which makes it too shallow to launch many boats. The approach to the ramp is also narrow, with mud on both sides, providing difficult launching conditions. Most waterfowl hunters have abandoned this launch and prefer to use a launch 2 miles away, which entails a much longer boat ride. We will dredge the ramp to make it deeper, put riprap around the ramp to stop the erosion, and fill in around the approach to provide a larger, firmer launch area.
05139225	Repair handicapped accessible hunt blind. \$26,000	Repair deteriorated handicapped accessible hunt blind. This blind is used to provide handicapped hunters an opportunity to hunt waterfowl. This blind was built in 1997 and has experienced deterioration since then. The concrete walkway has broken in some areas, many of the nails and screws have rusted off causing many boards to become loose. The camouflage netting over the top has deteriorated as well as the frame that supports the netting. The vegetation has started to close in around the blind reducing the area available for hunting. We will repair the concrete walkway, replace the loose boards and rusted off nails and screws, rebuild the frame for the camouflage netting and replace the netting. We will also spray some of the vegetation with herbicide to open the pond up.
2005232402	Remove abandon infrastructure from former West oil field. \$55,000	Remove abandon infrastructure from former West oil field. The oil field is not active and structures need removal to return the marsh to original conditions. May contain contaminated well pads. Removal of abandon infrastructure will allow proper management of the resources once original conditions are returned to the marsh.

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Work Order #	Project Title and Cost	Project Description
2005232350	Repair and stabilize eroding North Unit Gulf Intracoastal Waterway levee. \$475,000	Repair and stabilize eroding North Unit Gulf Intracoastal Waterway levee starting from the east boundary and working West. This levee is quickly eroding from wake action generated by barge traffic. Low areas of the levee that have already eroded through will be rebuilt with material obtained onsite. The Intracoastal Waterway bankline will then be stabilized by building a rock breakwater on the shallow water shelf within the GIWW. Because of access problems, all the work will be performed from a barge in the Intracoastal Waterway. Refuge lands located on the south bank of the Intracoastal Waterway have been protected from erosion in this way and it has been successful.
2005232359	Repair vehicular bridge at Star Lake. \$29,000	Repair vehicular bridge at Star Lake, including approach rails, signing, and reflectors, as per bridge safety report inspections. This bridge is used by refuge staff, the public, and inholding owners or leasers to access Star Lake and the central portion of the refuge.
2005230276	Rehabilitate Reservoir Road. \$45,000	Repair and reshape one mile of existing public use road that is used year around by the public for fishing and bird watching. The road provides the only access to a significant portion of the station's land that is available for public hunting. This road has deteriorated and needs additional gravel and reshaping. This project will provide funding necessary to contract work and purchase gravel.
2005232384	Rehabilitate Perkins Levee. \$90,000	Rehabilitate Perkins Levee. Levee has been subject to erosion from storm surge tides, rain, and damaged by feral hogs and alligators. This levee prevents saltwater intrusion and degradation of emergent coastal marshes in the 15,000-acre Star Lake Unit. This unit receives heavy use by wintering waterfowl. Perkins Levee also provides management access for staff and public access for waterfowl hunting.
2005238933	Repair deteriorated boat launch. \$30,000	Repair deteriorated boat launch at refuge headquarters. This boat launch is critical for management of the 5000-acre Wild Cow Bayou unit of the refuge because it is the only boat launch for this unit. The boat launch is also used by several hundred waterfowl hunters every year to access the popular hunting area. The boat launch is in need of gravel around the launch area. The dock associated with the boat launch is in need of repair also. The dock was built in 1992 and deteriorated over the years. Many nails and screws have rusted off and many boards are loose. Some of the hand rails have been broken. We will rebuild the dock, add gravel to the launch area, and dredge the launch area to make it deeper.
2005238922	Repair worn fishing pier at 10-mile cut bridge. \$25,000	Repair worn fishing pier at 10-mile cut bridge. This fishing pier is an extremely popular public use facility used by several hundred people every year for fishing and crabbing. This pier was constructed in 1991 and has experienced deterioration over the years. Many of the nails and screws have rusted off and many boards are loose and broken, which will be a safety hazard to the public if it is not fixed soon. We will replace most of the boards on the deck and rails with new boards. A refurbished fishing pier will serve the public safely for years to come.
2005238978	Rehabilitate worn Middleton Levee hunter access trail. \$75,000	Rehabilitate worn Middleton Levee hunter access trail. This levee is used by hunters to walk into the popular Mud Bayou hunt area. It provides important access to hunters without boats. This levee also allows cows to penetrate deeper into the marsh, providing important habitat management benefits. The levee has deteriorated due to storm surges and cattle use. We will contract an amphibious excavator to rebuild this levee.

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Work Order #	Project Title and Cost	Project Description
2005240828	Rehabilitate LeBlanc's Reservoir levees. \$221,000	Rehabilitate LeBlanc's Reservoir levees. These levees have eroded from storms, flooding, and damage from alligators. The levees are breached in numerous places and water management capabilities have been lost. As a result, high quality aquatic plant production has been lost, resulting in a reduction in the availability of quality wintering habitat for numerous waterfowl and wading birds. This project will reestablish levees of this freshwater impoundment which will allow salinity levels to be reduced.
2005238962	Rehabilitate deteriorated boat launch at the north end of Clam Lake. \$29,000	Rehabilitate deteriorated boat launch at the north end of Clam Lake. This boat launch is used by refuge biologists and law enforcement personnel to access the 5-mile cut area, which is an important waterfowl wintering area, and a popular waterfowl hunting area. The boat launch has experienced erosion around the ramp which makes it hard to launch boats. It has also silted in which makes it too shallow to launch many boats. The approach to the ramp is also narrow, with mud on both sides, providing difficult launching conditions. Most waterfowl hunters have abandoned this launch and prefer to use a launch 2 miles away, which entails a much longer boat ride. We will dredge the ramp to make it deeper, put riprap around the ramp to stop the erosion, and fill in around the approach to provide a larger, firmer launch area.
2005240909	Rehabilitate overgrown, silted-in boat canals in the White Unit. \$43,000	Rehabilitate overgrown, silted-in boat canals in the White Unit to allow boating access for the refuge waterfowl hunt program. Ditches are silted in and overgrown with vegetation, posing navigational hazards. Hunters whose boats may become hung up trying to navigate in canals can be stranded for extended periods.
2005240874	Replace boundary fence on western units of NWR. \$156,000	Replace 3 miles of refuge boundary fence on western units of NWR. Existing fences have been damaged during storms and through vandalism, and are subject to a corrosive environment. These fences mark the refuge boundaries, control trespass and damage of sensitive habitats, and designate pastures used in the refuge's rotational grazing program. Project includes signing and surveying where needed.
2005255837	Reservoir Road (RTE 100)	Preliminary Engineering. Provide planning and design of public use Reservoir Road at NWR. This project will include site visits, surveying needs, and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed road at NWR.
2005255842	Reservoir Road (RTE 100)	Preliminary Engineering. Provide planning and design of public use Reservoir Road at NWR. This project will include site visits, surveying needs, and site assessment and upon completion will identify design, specifications, and a cost estimate for the proposed road at NWR.
2005255829	Reservoir Road Route 101	Repair, regravol Reservoir Refuge road. This project will rehabilitate Reservoir Road Route 100 and will include routes 101 and 102. This road provides the primary means for accessing public use areas of NWR. It is heavily utilized and has not been rehabilitated for almost ten years. The road holds surface water and as a result has significant rutting and potholes.
2005255072	Reservoir Road Route 101	Repair, regravol Reservoir Refuge road. This project will rehabilitate Reservoir Road Route 100 and will include routes 101 and 102. This road provides the primary means for accessing public use areas of NWR. It is heavily utilized and has not been rehabilitated for almost ten years. The road holds surface water and as a result has significant rutting and potholes.

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Work Order #	Project Title and Cost	Project Description
2005260618	Large Bridge Rehabilitation/Replacement [p/d/cc]. \$1013,000	This project includes the planning, design, and construction to replace one bridge and rehabilitate a second bridge at NWR. Currently, the condition of both bridges represents a significant safety hazard. Specifically, the Ten-Mile Cut Bridge will be replaced and the Star Lake Corps Structure Bridge will be rehabilitated to include safety features and guardrails. The Ten-Mile Cut Bridge is deteriorated and worn to the point that rehabilitation is not an option as the wood supports are rotted and deteriorated. The Star Lake Corps Structure Bridge is hazardous to users because of the structural and safety deficiencies including deteriorated substructures and bridge decks, and nonexistent or inadequate guardrails and signs.
2006519042	Reservoir Road (Rte 100). \$125,000	Construction and rehabilitation of Reservoir Road (0.5 mi) to provide improved public access and to reduce safety hazards. FHWA included the road in the 2001 inventory & condition assessment.
2006519053	Ring Levee Road (Rte 200) and parking lot (904). \$334,000	Construction and rehabilitation of Ring Levee Road (Rte 200, 0.7 mi) and parking lot 904. The project is needed to provide improved public access for refuge visitors and to reduce safety hazards. FHWA included the road in the 2001 inventory and condition assessment.
2006535860	Rehabilitate Ring Levee Road. \$42,000	Rehabilitate the one mile length of Ring Levee Road on NWR. The road has not been resurfaced for more than ten years. Due to the lack of gravel, the road has become rutted and pothole. The road is heavily utilized for refuge management purposes and also critical for operation of oil facility inholding. Funding will be used to purchase gravel necessary to adequately repair this road.
2006535863	Rehabilitate and retrofit old and deteriorating office building. \$380,000	Rehabilitate and expand the existing administrative building. The building has experienced significant deterioration that has been accelerated due to the influence of saltwater. The electrical system, roof, and siding need to be replaced. This 1,694 square foot building provides office space for seven staff members. Due to insufficient space, staff members are forced to share offices. Storage space for administrative files and refuge equipment is insufficient. The buildings present conditions present numerous health and safety hazards.
2006535873	Repair deficient headquarters parking area. \$31,000	Rehabilitate headquarters parking area by adding gravel and repairing barriers. This parking area includes a repoured concrete area that doubles as a helicopter pad for fire operations. The parking area is used by refuge staff and visitors. It is also the primary parking site for waterfowl hunters using the Permit hunt unit.
2006535423	Rehabilitate old shop building. \$223,000	Rehabilitate old shop building to make it weather proof and provide a safe and secure facility to maintain and store refuge heavy equipment. Original metal building was erected in 1981, and has been subjected to salt air, wind, and storms. Roof and sides leak, and roll up doors need maintenance. Steel frame is still sound, however, siding and roof are full of holes, and electricity is sporadic. Rehab could be accomplished in one year.
2006535425	Rehabilitate old shop building. \$223,000	Rehabilitate old shop building to make it weather proof and provide a safe and secure facility to maintain and store refuge heavy equipment. Original metal building was erected in 1981, and has been subjected to salt air, wind, and storms. Roof and sides leak, and roll up doors need maintenance. Steel frame is still sound, however, siding and roof are full of holes, and electricity is sporadic. Rehab could be accomplished in one year.

DEFERRED MAINTENANCE MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
2006535443	Replace Shop building constructed in 2000. \$300,000	Replace Shop building to ensure that refuge maintenance facilities remain safe for maintenance staff and for storing equipment. This wood framed building with metal siding was constructed in 2000 but has taken a beating over the years in this harsh environment of salt air, hurricanes, and violent thunderstorms. This is the primary building for maintenance of refuge heavy equipment, and it houses the maintenance crew offices. It may take 2 years to plan and construct a new shop.
2006535468	Rehabilitate Eroded E Ditch. \$34,000	Rehabilitate eroded E Ditch. The ditch is silted in and grown over, making the canal impassable and creating a navigational hazard. The project will eliminate silt buildup in the ditch. The ditch canal provides the only possible access to waterfowl hunting areas by the public using boats. If ditches are not maintained, hunters will not be able to access areas for hunting. In addition, silted-in stretches of ditch, can strand boats or cause accidents creating unsafe situations.
2006535444	Replace Shop building constructed in 2000. \$300,000	Replace Shop building to ensure that refuge maintenance facilities remain safe for maintenance staff and for storing equipment. This wood framed building with metal siding was constructed in 2000 but has taken a beating over the years in this harsh environment of salt air, hurricanes, and violent thunderstorms. This is the primary building for maintenance of refuge heavy equipment, and it houses the maintenance crew offices. It may take 2 years to plan and construct a new shop.
2006535450	Repair eroded spillways along North bank of Gulf Intracoastal Waterway. \$220,000	Repair eroded spillways along North bank of Gulf Intracoastal Waterway to protect large freshwater marsh from saltwater intrusion. The 2 spillways allow freshwater to drain from the marsh while keeping saltwater out. Erosive tugboat and barge wakes have eroded the dirt bank around the ends of the spillways threatening to allow saltwater into the marsh. Project would rebuild the bankline and place riprap or concrete mats on the bank to stop the erosion. Loss of the use of these spillways would eliminate our ability to manage the area as a freshwater marsh. Planning, design, and construction contracting can be accomplished in one year.
2006535725	Rehabilitate Wild Cow Bayou Levee. \$206,000	Rehabilitate approximately 5 miles of levee that has deteriorated. This levee impounds water within a 5,600 acre freshwater wetland management unit. It also serves a barrier to saltwater. Due to a lack of maintenance and storm events, the levee has developed numerous breaches that allow saltwater to enter the impoundment. As a consequence, 5,600 acres of valuable freshwater wetland habitat is in jeopardy of becoming highly fragmented, resulting in significant loss of valuable fish and wildlife habitat.
2006535457	Rehabilitate eroded White's levee. \$141,000	This project would repair the eroded White's Levee. This levee has eroded due to storm surges and subsidence. This 3.5 mile levee is critical for water management of 15,000 acres of wetlands. These wetlands support over 100,000 wintering waterfowl and numerous other wildlife species. This levee also provides access for recreational waterfowl hunters.
2006535899	Replace damaged original refuge boundary fences. \$365,000	Replace worn boundary fences on the original refuge. These fences have been damaged by storm surge and the corrosive marine environment and by vandalism. These fences are essential to manage cattle in support of the grazing management program which promotes food resources for waterfowl. Trespassing cattle are detrimental to this management program and are a hazard to visitors using the refuge.

DEFERRED MAINTENANCE MMS REPORT FOR MCFADDIN NWR

Work Order #	Project Title and Cost	Project Description
2006535907	Replace worn automatic entrance gate. \$48,000	Replace the front entrance gate at with new model. Gate is 200 yards from the gulf, and salt air and spray erodes metal and electronic security gate. Automatic timer opens and closes the refuge entrance at daylight and dark, providing essential security and safety for the refuge and resident staff after hours. Programmable function is vital for hunt program openings at 3:00 am.
2006535911	Rehabilitate eroded B-Ditch in Wild Cow Bayou Unit. \$28,000	Rehabilitate eroded B-Ditch in Wild Cow Bayou Unit. Ditch has silted in and become impassable. Ditch is used by waterfowl hunters to access popular waterfowl hunting area. Ditch is also used by refuge personnel to access area for habitat management. Silt and vegetation will be removed.
2006535919	Repair Equipment Storage Building (airboat barn). \$27,000	Repair worn equipment storage building to protect valuable refuge equipment from weather and provide a secure storage area. Refuge airboats, tractors, and bulldozer are stored in this building, which can be locked. Many of the overhead doors are worn and the tracks are coming apart. Most of the doors can not be locked anymore. The condition assessment in 2002 identified these deficiencies. Since then, the roof and walls have developed leaks in several areas because of severe weather. Repair of this facility will facilitate management of 54,000-acre refuge by protecting equipment that is essential for refuge management.
2006535923	Repair handicapped accessible hunt blind. \$26,000	Repair deteriorated handicapped accessible hunt blind. This blind is used to provide handicapped hunters an opportunity to hunt waterfowl. This blind was built in 1997 and has experienced deterioration since then. The concrete walkway has broken in some areas, many of the nails and screws have rusted off causing many boards to become loose. The camouflage netting over the top has deteriorated as well as the frame that supports the netting. The vegetation has started to close in around the blind reducing the area available for hunting. We will repair the concrete walkway, replace the loose boards and rusted off nails and screws, rebuild the frame for the camouflage netting and replace the netting. We will also spray some of the vegetation with herbicide to open the pond up.
2006535726	Rehabilitate Wild Cow Bayou Levee. \$206,000	Rehabilitate approximately 5 miles of levee that has deteriorated. This levee impounds water within a 5,600 acre freshwater wetland management unit. It also serves a barrier to saltwater. Due to a lack of maintenance and storm events, the levee has developed numerous breaches that allow saltwater to enter the impoundment. As a consequence, 5,600 acres of valuable freshwater wetland habitat is in jeopardy of becoming highly fragmented, resulting in significant loss of valuable fish and wildlife habitat.
2006535729	Rehabilitate the one-mile Grit Site Road. \$47,000	Rehabilitate the one-mile Grit Site Road. This is a earthen levee road that has eroded of time. Levee will be enhance and road will be reshaped. This is the only means for refuge personnel to access the station's grit site, which is very important for wintering waterfowl.

DEFERRED MAINTENANCE MMS REPORT FOR TEXAS POINT NWR

Work Order #	Project Title and Cost	Project Description
01115521	Repair One Mile of Deteriorated Cattlewalk Levee. \$64,000	This project will repair one mile of a deteriorated portion of Cattlewalk Levee at Texas Point NWR. This section of the levee is too low and is periodically inundated. Due to surface water runoff, the levee has eroded in numerous places. This project will increase the height of the levee to an elevation at which surface water will no longer traverse it. The levee also functions as a USFWS road and public use trail.
01115504	Replace 10 miles of damaged barbed wire fence.	This fence has been severely damaged by storms and fires. All of the fence posts have rotted and no longer support the wire. Barbed-wire has deteriorated to rusting. This fence provides the only barrier between adjacent private lands and the refuge. The fence will no longer hold cattle. Therefore, the refuge has not been able to implement its grazing program. Adjacent landowners trespass on the refuge, due to the deteriorated fence. Illegal grazing is adversely affecting habitat conditions on the refuge.
01115508	Replace deteriorated concrete boat ramp. \$64,000	Due to the influences of storms and tidal interchange has completely washed-out. It no longer functions and is completely unsafe for use. It is the only boat ramp by which the public can access the numerous tidal channels and other water bodies within the Refuge. Due to the loss of this ramp, the USFWS can no longer provide the public with adequate access to recreational areas within the Refuge.
2005159436	Replace Barbed wire Fence at Texas Point NWR \$48,000	This fence has been severely damaged by storms and fires. All of the fence posts have rotted and no longer support the wire. Barbed-wire has deteriorated to rusting. This fence provides the only barrier between adjacent private lands and the refuge. The fence will no longer hold cattle. Therefore, the refuge has not been able to implement its grazing program. Adjacent landowners trespass on the refuge, due to the deteriorated fence. Illegal grazing is adversely affecting habitat conditions on the refuge. Due to urban encroachment, USFWS can no effectively implement a prescribed burning program on Texas Point NWR. This has placed an emphasis on the importance of grazing for management purposes at the Refuge. Currently, the USFWS is not able to graze most of the Refuge because of the lack of a proper fence. This project will reestablish the boundary fence at Texas Point NWR and allow the USFWS to once again administer an adequate grazing program at the Refuge.
2005186481	Replace the deteriorated concrete boat ramp at Texas Point.	Due to the influences of storms and tidal interchange has completely washed-out. It no longer functions and is completely unsafe for use. It is the only boat ramp by which the public can access the numerous tidal channels and other waterbodies within the Refuge. Due to the loss of this ramp, the USFWS can no longer provide the public with adequate access to recreational areas within the Refuge.
2006535992	Repair One Mile of Deteriorated Cattlewalk Levee. \$64,000	This project will repair one mile of a deteriorated portion of Cattlewalk Levee at Texas Point NWR. This section of the levee is too low and is periodically inundated. Due to surface water runoff, the levee has eroded in numerous places. This project will increase the height of the levee to an elevation at which surface water will no longer traverse it. The levee also functions as a USFWS road and public use trail.

APPENDIX H: LAND PROTECTION PLAN FOR THE TEXAS CHENIER PLAIN REFUGE COMPLEX EXPANSION

I. PROJECT DESCRIPTION

The Texas Chenier Plain NWR Complex currently includes over 105,000 acres of public land managed and administered by the USFWS as native wildlife habitat. The Complex includes four separate refuges including: Anahuac National Wildlife Refuge (NWR), McFaddin NWR, Texas Point NWR and Moody NWR. The Complex and the proposed acquisition area occupy low lying coastal prairies, near coastal woodlots, and coastal wetlands between Trinity Bay to the west and the Sabine River on the east. Chambers, Jefferson and Galveston Counties have jurisdiction over portions of the Complex or proposed acquisition areas. A quick summary for each refuge is shown below in Table H-1.

- Moody NWR is located along East Galveston Bay in south-central Chambers County. The town of Smith Point is approximately 5 miles west of this Refuge. The USFWS holds a perpetual, non-development conservation easement on the Moody NWR, which is otherwise entirely privately-owned and managed.
- Anahuac NWR is located on the north shore of East Galveston Bay. Almost all of the Refuge lies within Chambers County, with a small portion lying south of the GIWW in Galveston County. The Refuge is bounded by Robinson Bayou on the west, State Highway 124 on the east, several private farms and ranches and F.M. Road 1985 on the north, and East Bay and the GIWW on the south. Refuge Complex and Anahuac NWR staffs are headquartered in the city of Anahuac, located 18 miles northwest of the Refuge.
- McFaddin and Texas Point NWRs are located on the southeastern tip of the Upper Texas Coast, adjacent to the Gulf of Mexico. All of Texas Point NWR and most of McFaddin NWR are located in Jefferson County. Texas Point and McFaddin NWRs are bounded on the south by the Gulf of Mexico, and the refuges contain approximately 6 and 15 miles of Gulf shoreline, respectively. The GIWW dissects McFaddin NWR and divides once contiguous watersheds into two distinct units. Texas Point NWR is adjacent to the town of Sabine Pass, and McFaddin NWR lies 12 miles further west. The town of High Island is located along the Gulf near the McFaddin NWR's western boundary. Office facilities for the staffs of the McFaddin and Texas Point NWRs and some Refuge Complex staff (Fire Management) are located on the McFaddin NWR.

Table H-1.
National Wildlife Refuges within the Texas Chenier Plain Complex

Refuge	Acreage	Date of Establishment	Ownership
Anahuac	34,339	1963	Fee Title
McFaddin	58,861	1980	Fee Title and Conservation Easements
Texas Point	8,952	1979	Fee Title
Moody	3,516	1961	Conservation Easement

II. THREAT TO AND STATUS OF RESOURCE TO BE PROTECTED

The coastal marshes, prairies and woodlots of the Chenier Plain region of southwestern Louisiana and southeast Texas comprise a hemispherically important biological area. The Texas Gulf Coast is the primary site for ducks wintering in the Central Flyway, with an average of 1.3-4.5 million birds, or 30-71% of the total flyway population (Stutzenbaker and Weller 1989). This area also winters 90% of the snow, Canada, and greater white-fronted geese in the Central Flyway (Buller 1964). Additionally, the coastal marshes, prairies and prairie wetlands of the Chenier Plain region of the Texas Gulf Coast serve as a critical staging area for Central Flyway waterfowl migrating to and from Mexico and Central and South America. Hundreds of thousands shorebirds, wading birds, and other marsh and waterbirds also winter or migrate through the region, including several now identified by the USFWS as avian Species of Conservation Concern. Coastal prairie and coastal woodlots support over 150 migratory and resident landbird species, including 9 species of grassland birds and 7 species utilizing woodland habitats listed as Rare and Declining within the Coastal Prairies Region of Texas (Texas Parks and Wildlife Department 2000). Overall, wetland, prairie and woodland habitats on the Refuge Complex provide habitat for 33 avian Species of Conservation Concern in the Gulf Prairies Bird Conservation Region (under the North American Bird Conservation Initiative).

The "Wetland Preservation Program, Category 8 – Texas Gulf Coast" was a joint effort between Federal, State, and Private participants to identify high-value wintering waterfowl habitat along the Texas coast that required little or no additional development. The USFWS had ranked the Texas Gulf coast as Number 8 out of 33 categories on a national priority scale based on its importance to the Nation's waterfowl resource. Further, the USFWS had ranked the Texas Gulf coast Number 4 as a national "Important Resource Problem (IRP) area. In early 1977, a group of conservationists representing Ducks Unlimited, sportsmen, businessmen, Texas General Land Office, Texas Parks and Wildlife Department, and the USFWS delineated 25 key areas of habitat along the Texas Gulf coast having high value to the waterfowl resource. These 25 areas were ranked by a team of Texas Parks and Wildlife Department, Texas General Land Office, and USFWS personnel; and, acquisition of the private lands was recommended for the top 20 areas as being necessary for habitat preservation. This plan and report was "updated" in August of 1981. Within the Chenier Plain region of the upper Texas Gulf coast, the "Category 8 Plan" identified the following five high-value wintering waterfowl habitats: (#1) Oyster Bayou Marsh, (#4) Lake Surprise area, (#5) McFaddin Marsh, (#7) Sea Rim Marsh, and (#10) Robinson Bayou Marsh. (The numbers indicate that area's "Preservation Effort Priority" ranking). All of these five high-value wintering waterfowl habitats are included in this expansion alternative.

The Emergency Wetlands Resources Act of 1986 (Public Law 99-645) was enacted by the United States Congress to: "Promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes". In compliance with this Act, the USFWS has prepared the National Wetlands Priority Conservation Plan. The National Plan provides the framework, criteria, and guidance for identifying wetlands warranting priority attention for Federal and State acquisition. Its primary purpose is to help decision-makers focus their acquisition efforts on the more important, scarce, and vulnerable wetlands in the Nation. The National Plan requires each of the seven USFWS Regions to prepare Regional Wetlands Concept Plans that address the wetlands of each State within each Region.

The USFWS' Region 2 encompasses the States of Arizona, New Mexico, Oklahoma and Texas. In 1990, Region 2 published its Regional Wetlands Concept Plan addressing the wetland issues of each State separately. The Regional Wetlands Concept Plan steps down the National Plan to the local, site-specific level and discusses the wetland functions, values, threats and other issues on a state by state basis. The Regional Plan contains a list of priority wetlands sites that have been evaluated through the wetlands assessment threshold criteria of the National Wetlands Priority Conservation Plan and qualify for acquisition under the Emergency Wetlands Resources Act. The wetlands in Texas were broadly grouped into six categories: 1) Gulf coast salt and freshwater marshes; 2) bottomland hardwood forests in the river valleys of East Texas; 3) playa lakes of the Panhandle region; 4) freshwater springs and their headwater streams of Central and Southwest Texas; 5) West Texas riparian areas; and 6) coastal pothole wetlands

of South Texas. Each group is addressed in terms of the following three criteria used for prioritization: 1) Wetland Loss, 2) Wetland Threats, and 3) Wetland Functions and Values. Within the Chenier Plain region of the upper Texas Gulf coast, the Regional Plan identified the following four areas as “Texas Priority Wetlands for Acquisition Consideration”: 1) Middleton Marsh, 2) Horseshoe Marsh, 3) Lower Marsh, and 4) Robison Bayou Marsh. Each of these four wetland sites meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan. All four of these wetlands sites are included in this expansion proposal.

The Emergency Wetlands Resources Act of 1986 also requires the USFWS to conduct wetland status and trend studies of the Nation’s wetlands at 10-year intervals and report the results to Congress. The latest report, published in December of 2000, is entitled; Status and Trends of Wetlands in the Conterminous United States 1986 to 1997. It reports that 98% of all losses recorded during its study were to freshwater wetlands. Freshwater emergent marshes and freshwater forested wetlands each lost an estimated 1,200,000 acres between 1986 and 1997. The net loss of all freshwater wetland types was 633,500 acres because the numeric losses of freshwater wetlands were partially offset by gains in freshwater shrub wetlands (1.1 million acres) and freshwater ponds (631 thousand acres). The long-term trends in freshwater wetlands since the 1950s, show that freshwater emergent wetlands have declined by the greatest percentage of all wetland types with nearly 24% lost (8 million acres) while freshwater forested wetlands have sustained the greatest overall loss in area (10.4 million acres).

The USFWS, in cooperation with the Texas Parks and Wildlife Department and the Texas General Land Office, reported on the status and trends of coastal Texas wetlands in accordance with the Coastal Wetlands Planning, Protection, and Restoration Act of 1990 (Title III of Public Law 101-646). Their report, published in 1997, analyzed data from a 12.8 million acre coastal Texas study area. Aerial photographs from the mid-1950s and early 1990s were analyzed to detect changes in wetlands, deepwater habitats, and uplands acreage. Palustrine (freshwater) emergent wetlands (fresh marsh, wet prairie, etc.) declined by about 29 percent, with an estimated net loss of 235,100 acres. This was the largest acreage change for any wetland category studied. Most of the palustrine emergent loss was to upland agriculture and other upland land uses (i.e. development).

The USFWS defined the various wetland types in Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS-79/31, December, 1979). Further, the USFWS classified seven of these wetland types as “decreasing” in its Land Acquisition Priority System (LAPS). The “decreasing” wetland types are; 1) Palustrine Emergent, 2) Palustrine Forested, 3) Palustrine Scrub-Shrub, 4) Estuarine Intertidal Emergent, 5) Estuarine Intertidal Forested, 6) Estuarine Intertidal Scrub-Shrub, and 7) Marine Intertidal. Using National Wetlands Inventory data available at <http://nwi.fws.gov>, the USFWS’ Region 2 GIS Coordinator mapped the proposed acquisition areas identifying the wetland areas and the areas of aggregated decreasing wetland types. Using the seven aggregated decreasing wetland types, he developed summary tables which compare decreasing wetland types to non-decreasing wetland types and wetlands to uplands. A summary table is presented for the boundary expansion proposal.

Over 9 million acres of native tallgrass prairie once occurred along the western Gulf Coast in Texas and Louisiana (Smeins *et al.* 1991). Based on remnant stands of native grasslands, prairies on the upper Texas coast were characterized by little bluestem, brownseed paspalum, and Indiangrass or eastern gammagrass and switchgrass associations, depending on hydrology (Diamond and Smeins 1984). It is now estimated that 99.8% and 99.6% of little bluestem prairies and

	Acres	Percentage of Boundary Expansion
Boundary Expansion		
Alternative C	64,260	100%
Habitat Type (Upland or Wetland) of Alternative B Expansion		
Uplands	21,360	33%
Wetlands	42,900	67%
Declining Wetland Types	38,520	
Non-declining Wetland Types	4,380	

eastern gamma grass/switchgrass prairies, respectfully, have been lost in Texas (McFarland 1995). The little bluestem-brownseed paspalum community has been identified as a “threatened natural community” and the eastern gammagrass-switchgrass community has been identified as an “endangered natural community” by the Texas Organization for Endangered Species (Diamond *et al.* 1992). The Texas Organization for Endangered Species (TOES) defines “threatened natural community” as any series-level natural community vulnerable to extirpation in Texas, with six to twenty occurrences in Texas and 100 or fewer occurrences globally. TOES defines “endangered natural community” as any series-level natural community in immediate danger of extirpation in Texas, with five or fewer known occurrences in Texas and 100 or fewer occurrences globally. Both communities are assigned a Global conservation status rank of “Critically Imperiled” (G1) by The Nature Conservancy (2002).

Many animal species typical of northern prairies, such as Henslow’s Sparrows, Smooth Green Snakes, and Prairie Voles, were all found year-round in the Gulf coastal prairies. Dickcissels still nest in these coastal grasslands, and many other avian species utilize Gulf coastal prairies as wintering and/or migratory habitat. Many of the birds that would benefit from protection and management of native coastal prairie habitats under this Alternative are species that are declining in the Coastal Prairies Region of Texas (Shackelford and Lockwood 2000), and/or are among several species recently listed by the USFWS as “Avian Species of Conservation Concern” in the Gulf Prairies Bird Conservation Region (USFWS 2002). For example, Mottled Duck, White-tailed Hawk, Northern Bobwhite, Yellow and Black Rail, Buff-breasted Sandpiper, Short-eared Owl, Sedge Wren, and LeConte’s Sparrow are all species of conservation concern that would benefit from conservation of prairie habitats.

The Mottled Duck is a southern species that spent its whole life cycle in coastal prairies and adjacent marshes. The historical prairie-wetland continuum of the upper Texas coast provided nesting cover and brood habitat in close proximity. In a study of Mottled Duck nesting in agricultural lands in Louisiana, the habitat category that was most like native coastal prairie, permanent pasture with knolls, provided better nesting habitat than any other (Durham and Afton 2003). The dense nesting cover and mima mounds that are characteristic of coastal prairie probably provided excellent nesting habitat for resident Mottled Ducks. Stutzenbaker (1988) identified shallow depressional wetlands found in the prairie zone, known as “sennabean ponds,” as valuable brood rearing habitat. Protecting extant coastal prairie and restoring adjacent prairie and wetland habitats will increase quality nesting habitat for Mottled Ducks on the upper Texas coast.

Statewide in Texas, the coastal prairie has seen the greatest industrial development since World War II (Schmidly 2002). Most of the original coastal prairie has been lost because of direct conversion to other cover types, i.e. improved pasture, cultivated rice and other crops, and industrial, urban or suburban development. Additionally, remaining areas have been altered through a number of factors, primarily changes in fire, herbivory, and hydrology. Native prairies managed as pastures face such threats as homogenized burn regimes, overgrazing, and application of broadleaf herbicides. All these management practices are thought to reduce the floristic diversity that exemplifies coastal prairies (Allain and Johnson 1997). The introduction of non-native plant species has also impacted native coastal prairies on the Gulf Coast, and invasive exotic species such as Chinese tallow pose a significant threat to remnant prairies.

The USFWS’ proposed boundary expansions of the Moody and Anahuac NWRs under this Alternative contain important coastal prairie habitats. The Nature Conservancy’s Gulf Coast Marshes and Prairies Ecoregional Conservation Plan identified the “Middleton Prairie” and “Robinson-Oyster Bayou” areas in Chambers County as important conservation areas because they contain remnants of both “Critically Imperiled” prairie plant communities (The Nature Conservancy 2002). Both areas contain an historical topographic feature called “mima mounds”. These mounds provide the topographic and hydrological variability believed responsible for much of the floristic diversity found in high quality coastal prairies (Grace *et al.* 2000).

III. PROPOSED ACTION AND OBJECTIVE

The purpose of implementing a refuge boundary expansion proposal is to help the USFWS achieve larger mandates provided by law and treaty that are related to the protection of migratory birds and other trust resources. Implementation of a boundary expansion proposal is expected to assist the USFWS meet its goals and objectives of the ecosystem plan for the Texas Gulf Coast. Although achievement of the refuge purposes is not necessarily dependent upon additional land acquisition, the possible inclusion of other lands within the refuges should assist the USFWS in achieving its larger ecosystem-wide goals and objectives to ensure the long-term sustainability of migratory bird populations. Expansion of any of the Complex's constituent refuge acquisition boundaries would thereby authorize the USFWS to work with willing sellers using the acquisition standard and parameters defined in USFWS law, policy, and government regulations. Lands acquired by the USFWS would be managed as part of the National Wildlife Refuge System.

Expansion Proposal

This proposal continues the four refuge's historic focus on land acquisition primarily in the coastal marsh and adjacent agricultural uplands. Much of the acquisition would still focus on habitats of particular value to the waterfowl resource and other wetland dependent migratory birds. The wetlands portions of this expansion proposal concentrate on high-value wintering waterfowl habitats near the coast that are contiguous to existing refuges. This focus supports the goal of the Gulf Coast Joint Venture Chenier Plain Initiative which is stated as follows: "The goal of the Chenier Plain Initiative is to provide wintering and migration habitat for significant numbers of dabbling ducks, diving ducks, and geese (especially lesser snow and greater white-fronted), as well as year-round habitat for mottled ducks." Priority is given to those wetland areas which have long been identified as high-priority areas for acquisition in USFWS documents such as the "Wetland Preservation Program, Category 8 – Texas Gulf Coast" and the "Emergency Wetlands Resources Act, Region 2 Wetlands, Regional Concept Plan".

In addition to these primarily wetland areas, this proposal includes two areas of important coastal prairie with high habitat value for resident mottled ducks, many species of grassland-dependent migratory birds, and a wide variety of other native wildlife species. The primary habitat type for these areas is non-saline prairie, of which a significant component is prairie/grassland which is a unique community type within the Texas Chenier Plain. One of these areas, "Middleton prairie", is probably the largest remnant native coastal tallgrass prairie remaining on the Upper Texas Coast.

Besides the two above-described types of high biological value habitats, this proposal contains those areas identified by refuge management as necessary for the following reasons:

- lands that "fill in the gaps" in earlier single-ownership based expansions and complete logical biological/geographical boundaries,
- lands hydrologically linked to adjoining already-acquired refuge lands,
- lands whose acquisition would contribute to more effective management of the already acquired lands.

Expansion of the existing acquisition boundary is proposed for each of the four refuges in the Complex as follows:

<u>Refuge</u>	<u>Size of Boundary Expansion</u>
Moody NWR	7,920 acres*
Anahuac NWR	47,750 acres*
McFaddin NWR	7,190 acres*
Texas Point NWR	1,400 acres*

** All acreage figures are approximate*

The 64,260 acre expansion proposal for the entire Complex is depicted on the Locator Map in Appendix H.

IV. PROTECTION ALTERNATIVES

No action: No additional areas would be slated by acquisition by USFWS and the lands would remain in private ownership. Current activities on the private lands, including prescribed burning, grazing, hunting, and rice farming, would likely continue as long as these activities are economically feasible for the landowner. Active rice farming, which provides valuable wildlife habitat and food sources, is declining in the acquisition areas and much of the acreage in the USDA farm program is now either fallow or converted to improved pasture. Agricultural areas are being managed for grazing and areas not grazed may be invaded by Chinese tallow and deep-rooted sedge, which provide little wildlife benefit and increases expenses to convert the area back to rice production. The future of the lands would be subject to the discretion of the landowner whether the land would stay in an undeveloped agricultural setting or converted to other uses in the long-term, which may include eventual development. There are no large conservation acquisition projects being proposed in the area by State agencies or private non-profit conservation organizations.

USFWS acquisition: For all land and interests in land acquired by the USFWS, title is taken by the United States of America. The USFWS acquires most land in one of two ways: 1) in fee, or 2) conservation easement. The “fee” means virtually all of the rights and interests in the land, that which would be generally recognized as “ownership of the land”. Fee acquisition removes the land from the tax rolls. Fee acquisition gives the USFWS exclusive possession and use of the land which would allow for compatible public recreational activities. Fee acquisition allows the USFWS to perform any of the management activities (i.e. water control, burning, etc.) deemed necessary for habitat conservation on that land. The fee acquisitions are typically subject to reserved or outstanding subsurface mineral interests and other existing surface easements, such as pipelines or other rights-of-way. The purchase of a conservation easement is the acquisition of a much lesser interest in the land. “Ownership of the land” does not transfer to the United States and the land remains on the tax rolls with the underlying private landowner having the tax obligations. Conservation easements can consist of one or more of the two following categories of interests in land: 1) negative covenants, which prevent a specific use (i.e. no development) and 2) possessory interests, which grant a specific use right (i.e. public hunting). Conservation easements are an acquisition option when adequate habitat conservation can be achieved without the USFWS acquiring full ownership of the land. Conservation easements are not always a viable option with willing sellers because some sellers wish to dispose of all of their interests in the land for various reasons. Conservation easements are appraised and purchased in the same way as fee acquisitions. Also, the USFWS generally accepts donations of both fee and conservation easements.

Both fee acquisition and the acquisition of conservation easements have been used in the past on the refuges in the Texas Chenier Plain NWR Complex. At Moody NWR, all of the USFWS’ interests in land are in the form of a conservation easement. At Anahuac NWR, all of the USFWS’ interests in land are in fee except for a public access road easement. At McFaddin NWR, the mix of the USFWS’ interest in land is 86% fee and 14% conservation easement. At Texas Point NWR, all of the USFWS’ interests in land are in fee. The USFWS will consider both fee and conservation easement for future acquisitions dependent upon the habitat conservation requirements and the willing seller’s agreement.

In a few instances, the USFWS acquires interests in land by lease, right-of-way easement, or agreement. These are typically either for a shorter period of time or for more limited use purposes compared to fee and conservation easements.

Although the USFWS, like all agencies of the United States Government, has condemnation authority, it is the USFWS’ policy to acquire land and interests in land from **willing sellers only**. No lands have been condemned in the past for any refuge in the Texas Chenier Plain Complex and the USFWS does not propose condemnation of any lands in the future. The USFWS can acquire land or interests in land **only within an approved refuge boundary**. In fact, the USFWS can’t even accept a donation of land outside of an approved refuge boundary. Lands in any of the refuge boundary expansions would be acquired only from willing sellers as funding becomes available. Landowners within an expanded refuge boundary

would be completely free to keep their land, to sell their land to whoever they wished, to leave their land to their heirs, or to change uses of their land.

Including lands within a NWR boundary does not require the landowner to sell only to the USFWS nor does it limit that landowner's other conservation options and opportunities. The USFWS actively encourages all private landowners who are interested in wildlife or environmental conservation, whether their lands are within an approved refuge boundary or not, to avail themselves of the many other conservation programs and options available.

V. ACQUISITION ALTERNATIVES

The USFWS has only two primary land acquisition funding sources: 1) the Migratory Bird Conservation Fund, and 2) the Land and Water Conservation Fund. The Migratory Bird Hunting and Conservation Stamp Act of 1934, as amended (16 U.S.C. 718-718h) requires all waterfowl hunters 16 years of age and over to annually purchase and carry a Federal Duck Stamp. Approximately 98 cents of every Duck Stamp dollar goes directly into the Migratory Bird Conservation Fund to purchase wetlands and wildlife habitat for inclusion into the National Wildlife Refuge System. Since 1934, more than \$500 million has gone into this Fund to purchase more than 5 million acres of primarily waterfowl habitat. The Fund is administered by the Migratory Bird Conservation Commission and acquisition expenditures from this Fund require the approval of the governor of the state where the land to be purchased is located. This Fund has been the primary source of funding for land acquisition for all of the refuges within the Texas Chenier Plain NWR Complex and it is expected that it will remain the primary source of funding in the future. This discretionary land acquisition funding source is very actively competed for on a national level within the USFWS.

The other primary land acquisition funding source was authorized by the Land Water Conservation Fund Act of 1965, as amended (16 U.S.C. 4601-11). The Land and Water Conservation Fund (LWCF) appropriations are derived from Outer Continental Shelf oil & gas leases, tax on motorboat fuels, and the sale of certain surplus Federal lands. Forty per cent or more of Land and Water Conservation Funds are appropriated for Federal land acquisition for the National Park System, the National Forest System, the National Wildlife Refuge System, and the Bureau of Land Management. The balance of the Funds provides financial assistance to the States for planning, land acquisition and development of outdoor recreation opportunities. The LWCF is not a discretionary funding source and Congress appropriates money to a specific project or refuge for land acquisition. Some LWCF money has been appropriated to purchase land at McFaddin NWR but it has been a minor amount compared to the amount of Migratory Bird Conservation Funds used for land acquisition on the Complex.

VI. COORDINATION

Major issues related to the proposed actions were actively solicited from the general public, local public officials, local governmental entities, affected landowners, federal and state agencies, private organizations and the USFWS' interdisciplinary core Planning Team. Public scoping efforts to date include two series of public scoping meetings, public workshops, a town hall meeting, multiple briefings for local government officials and their staffs, and a waterfowl hunters' forum. A mailing list of over 1200 persons and organizations is maintained at the Refuge Complex Office and was used to distribute planning newsletters, and public meeting announcements.

The USFWS planning team, in particular the Complex Project Leader, made extensive efforts to inform and involve the counties and other local governments in the planning process. A number of formal briefings were provided for the Jefferson, Chambers, and Galveston County Judges and various County Commission members. Briefings were also provided for several local Drainage Districts and School Districts. Additionally, many of the County and other local government officials attended and participated in almost all of the public meetings held in their jurisdictions.

The USFWS recognizes that both the USFWS and the State fish and wildlife agencies have authorities and responsibilities for management of fish and wildlife on national wildlife refuges, as described in 43 CFR 24. Consistent with the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act, the Director of the USFWS will interact, coordinate, cooperate and collaborate with the State fish and wildlife agencies in a timely and effective manner on the acquisition and management of national wildlife refuges. The USFWS wanted to ensure coordination and cooperation with the State fish and wildlife agency early in the process of developing the Texas Chenier Plain NWR Complex EIS/CCP. Therefore, in February of 2000, the USFWS invited the Texas Parks and Wildlife Department (TPWD) to name a representative to participate as a member of the core planning team for this project. TPWD nominated Jim Sutherlin, Project Leader of the Upper Texas Coastal Ecosystem Office, as TPWD representative on the planning team.

In January of 2002, the USFWS requested a meeting with the TPWD representative to present draft conceptual refuge management alternatives and to obtain comments/suggestions. The meeting at Anahuac NWR headquarters was attended by TPWD staff biologist, Michael Reszutek, representing Mr. Sutherlin. At a May 15, 2002, meeting with TPWD Project Leader Jim Sutherlin at J.D. Murphree WMA in Port Arthur, Texas, the draft conceptual refuge boundary expansion alternatives along with draft maps were presented and discussed. There was also discussion on the draft conceptual refuge management alternatives, earlier presented to Mr. Reszutek.

On May 18, 2004, the Complex Manager and lead planner met with senior TPWD staff at TPWD headquarters in Austin, Texas. They presented an overview of the EIS, CCP, and scoping processes to date and a summary of the two sets of draft refuge management and refuge boundary expansion alternatives proposed for the draft document. Proposed changes/enhancements to waterfowl hunt and habitat management programs were highlighted along with details of the refuge expansion/land acquisition being proposed. There was considerable discussion about the two sets of draft alternatives which developed some useful suggestions and comments. A preliminary draft of this complete document was also presented to both local TPWD staff and the senior TPWD staff in Austin, Texas, for final comments prior to publication.

VII. SOCIOCULTURAL IMPACTS

Overall, most people's lifestyles and social interactions (including community cohesion, community stability, and social organization) would essentially remain the same as current conditions. Any social and/or lifestyle effects from the boundary expansion proposal on individuals and groups would be lessened because the USFWS would only acquire lands from "willing" sellers; it must be assumed that a willing seller has individually determined that any associated impacts from this land transfer to the USFWS is acceptable, or the transaction would not be made. Issues would also arise when management activities are perceived to adversely impact adjacent landowners or reduce economic benefits to the community. Those management actions that would continue to be controversial and have localized impacts include water management and prescribed fire activities.

The land and water of the Texas Chenier Plain have a rich heritage of public and commercial recreational activity. While recreation plays an important part in the economy of the area, outdoor recreation opportunities are also a traditional and substantial part of the social structure and lifestyles of the area. The USFWS is constantly struggling to balance recreational opportunities with its goal of protecting natural resources. Under any of the alternatives being considered, this struggle would continue, and no matter which expansion actions were implemented, there would continue to be considerable disagreement within the nearby population over the proper amount, locations, and access to recreational resources within the Refuge Complex.

VIII. SUMMARY OF PROPOSED ACTION

Introduction

The U.S. Fish & Wildlife Service has identified the properties that fall within the **preferred** boundary expansion alternative (**Alternative C**) for each of the refuges (Moody, Anahuac, McFaddin & Texas Point) and prepared Refuge Boundary Expansion Maps & Land Ownership Lists. The records for the Land Ownership Lists are based on the 2003 edition of the county tax appraisal rolls obtained from the Chambers, Galveston & Jefferson county appraisal districts.

The purpose of the Refuge Expansion Maps and Land Ownership Lists is to graphically represent the parcels of land that fall within **Alternative C** and identify the respective landowners.

Maps - Locator Map & Refuge Expansion Maps

The Locator Map and Refuge Boundary Expansion Maps are a graphical representation of **Alternative C** and indicate the lands which lie within the proposed boundary expansion for each refuge.

Map Locator

The Map Locator provides the context of the Texas Chenier Plain Refuge Complex and illustrates the refuge expansions in relation to each other. The Map Locator provides an overview of all four of the existing refuges and delineates their proposed expansion boundaries for **Alternative C**. The proposed expansion area for each refuge is divided into numbered sections that indicate on which Refuge Expansion Map individual parcels can be located.

Refuge Expansion Maps

The refuge expansion maps illustrate in detail the proposed **Alternative C** expansion boundary and the lands within the proposed boundary for **each individual refuge**. Each refuge expansion has its own set of maps along with an accompanying land ownership list. Tract numbers on the expansion maps correlate to records in the land ownership list with the same tract number.

Land Ownership List

Following each set of refuge expansion maps is the corresponding land ownership list for that refuge expansion. The land ownership list provides detailed information for the lands that fall within the expansion boundary. The following provides a description for each of the headings used in the ownership list and the information that can be found under each heading.

Tract Number - An arbitrary but unique number assigned by the USFWS to distinguish parcels of land within each refuge boundary expansion. The tract number on the Refuge Expansion Map directly corresponds to the record in the land ownership list with the same tract number. The tract number is used solely for the purpose of joining the delineated parcels on the maps to their corresponding data in the refuge expansion ownership list.

Name - Denotes the **primary** owner listed on the county tax appraisal rolls for lands associated with the tract number. Where **multiple landowners** exist for a single tract number, the **primary** landowner's name is followed by "**et al.**" indicating there are other owners. Though only the **primary** owner's name is denoted in the land ownership list, parcel tax id numbers for **every** owner associated with that tract number are listed.

Map Number - Indicates the map number(s) where each tract of land can be located on the refuge expansion maps. The maps illustrate the proposed expansion boundaries and the lands that fall within them by **each individual refuge**. Lands within each of the proposed expansion boundaries can be found on the following:

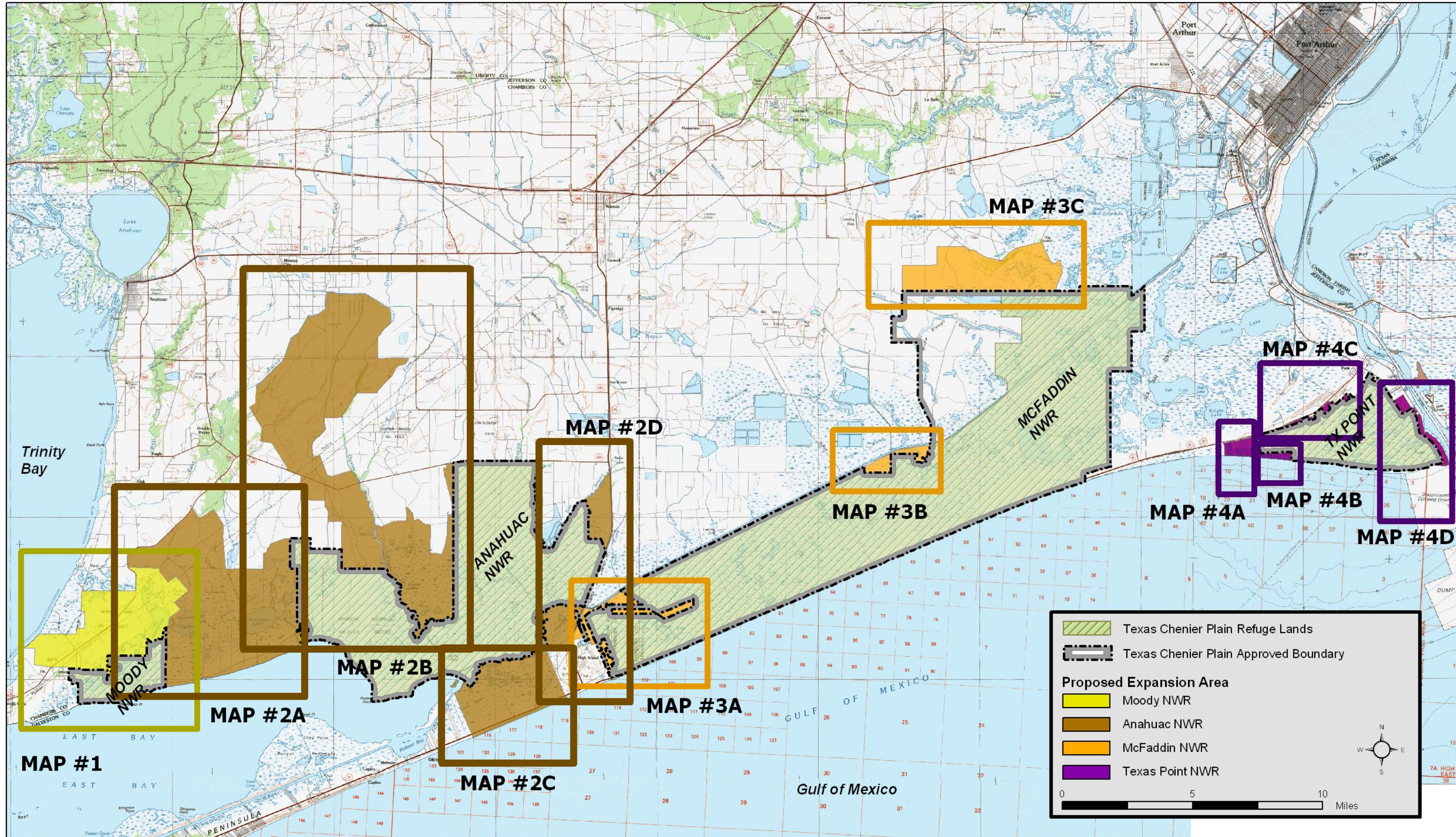
- Moody NWR Expansion / Map #1
- Anahuac NWR Expansion / Map #2A – D
- McFaddin NWR Expansion / Map #3A –C
- Texas High Point NWR Expansion / Map #4A –D

In some cases, a single tract of land may fall within two different refuge expansion boundaries. Since each refuge expansion has its own set of maps, the tract number would be located on both map sets.

Deeded Acreage -The deeded acreage for each tract was obtained from the county tax appraisal rolls. In cases where a single tract number may represent multiple parcels of land involving multiple owners, the deeded acreage figure reflects the **total** deeded acreage for the **combined** lands associated with the tract number.

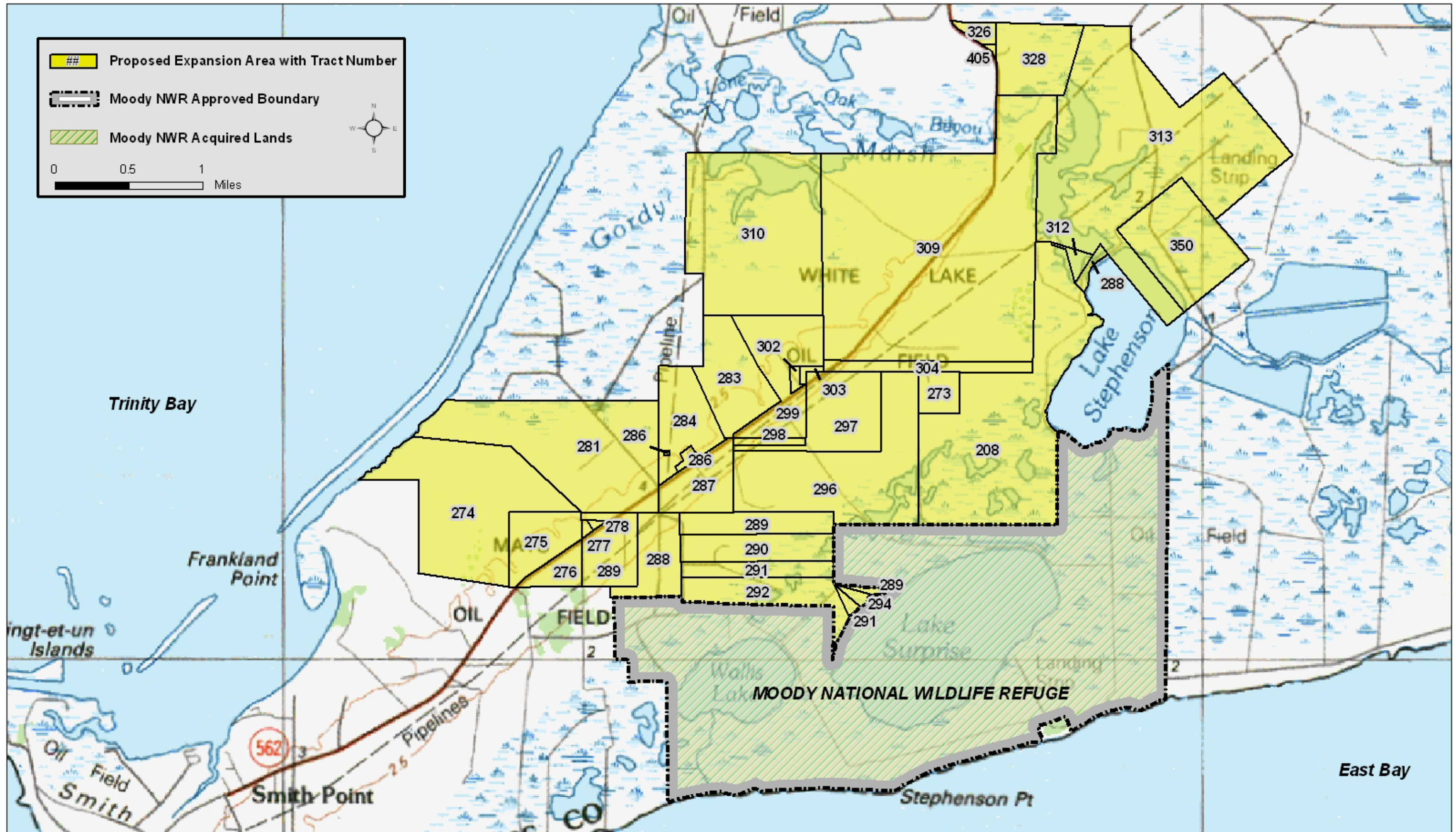
Priority - Priorities for land acquisition were developed from the alternatives presented in the EIS. Tracts with a (1) priority are contained in the EIS Alternative B and are primarily coastal march with some refuge management components. Tracts with a (2) priority are those areas not in Alternative B but added to Alternative C. These additional areas are primarily coastal prairie with some wetland components. Tracts with a (1 & 2) priority are tracts that divided between the 1 & 2 priority areas.

Parcel Tax ID – All parcel tax ID numbers associated with the land(s) for each tract number are listed. Though only the name of the **primary** owner name will be listed for tracts with multiple owners, the parcel tax id number for **every** owner is shown.





U.S. Fish & Wildlife Service
Moody National Wildlife Refuge



**Moody NWR Expansion Proposal (Alternative C)
Land Ownership List**

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
294	Baughman Jr, <i>et al.</i> , Ralph	1	8.22	1	00412-00200-00300-490100, 00412-00200-00400-490100, 00412-00200-00500-490110, 00412-00200-00500-490210, 00412-00200-00500-490310, 00412-00200-00500-490410, 00412-00200-00500-490510, 00412-00200-00200-490110, 00412-00200-00200-490210, 00412-00200-00100-490110, 00412-00200-00100-490210, 00412-00200-00100-490310, 00412-00200-00100-490410, 00412-00200-00100-490500
278	Brasseaux, Shirley	1	3.00	2	00217-00300-00100-50001
289	Brasseaux, <i>et al.</i> , Shirley	1	247.21	1	00412-00100-00700-490001, 00412-00100-00200-490001, 00412-00100-00500-490001, 00412-00100-00600-490001, 00412-00100-00300-490001, 00412-00100-00100-490001, 00412-00100-00400-490001, 00412-00100-00700-490100, 00412-00100-00100-490100, 00412-00100-00200-490100, 00412-00100-00300-490100, 00412-00100-00400-490100, 00412-00100-00500-490100, 00412-00100-00600-490100, 00217-00200-00200-500001, 00217-00200-00700-500001, 00217-00200-00500-500001, 00217-00200-00600-500001, 00217-00200-00300-500001, 00217-00200-00100-500001, 00217-00200-00400-500001
350	Brown Foundation	1	5430.00	1	00405-00100-00100-420001, 00211-00100-00100-420001, 00097-00200-00200-480001, 00099-00100-00400-480001, 00097-00100-00100-480001, 00415-00100-00100-490001,

Moody NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
350	Brown Foundation CONTINUED	1	5430.00	1	00317-00100-00100-490001, 00359-00100-00100-490001, 00158-00100-00100-690001, 00203-00100-00100-490001, 00032-00100-00100-670001, 00200-00100-00100-490001, 00200-00100-00200-490001, 00201-00100-00100-490001, 00184-00100-00100-490001
286	CHC I Limited	1	15.65	2	00192-00400-00100-500001, 00192-00400-00100-500001
328	Cockrell, <i>et al.</i> , Laura	1	146.66	1	00345-00100-00100-420001, 00345-00100-00600-420001, 00345-00100-00300-420001, 00345-00100-00500-420001, 00345-00100-00800-420001, 00345-00100-00400-420001, 00345-00100-00200-420001
273	Donley, Mary & Humphrey, Lionel	1	51.00	1	00469-00200-00100-490001, 00469-00200-00300-490001
312	Ezer, Charles	1	23.00	1	00606-00100-00000-420001
313	Ezer, <i>et al.</i> , Charles	1	4691.50	1 & 2	00384-00100-00200-420001, 00332-00100-00200-420001, 00211-00200-00200-420001, 00211-00200-00100-420001, 00392-00100-00100-430001, 00392-00100-00200-430001, 00258-00200-00100-430001, 00258-00200-00200-430001, 00403-00100-00200-420001, 00403-00100-00100-420001, 00404-00100-00200-420001, 00404-00100-00100-420001, 00402-00100-00200-420001, 00402-00100-00100-420001, 00397-00100-00200-420001, 00397-00100-00100-420001, 00385-00100-00100-420001, 00385-00100-00200-420001, 00332-00100-00100-420001, 00343-00100-00100-420001, 00323-00100-00100-420001, 00323-00100-00000-420001, 00343-00100-00200-420001, 00384-00100-00100-420001,

**Moody NWR Expansion Proposal (Alternative C)
Land Ownership List**

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
313	Ezer, <i>et al.</i> , Charles CONTINUED	1	4691.50	1 & 2	00021-00200-00100-420001, 00021-00200-00200-420001
405	Foster, <i>et al.</i> , Patricia	1	61.62	1	00160-00200-00100-420200, 00160-00200-00100-420001, 00160-00200-00200-420001, 00160-00200-00100-420100
326	Gau, Henry	1	202.00	1 & 2	00021-02700-00100-420001, 00160-00100-00100-420001
292	Hallmark, <i>et al.</i> , Martha	1	123.00	1	00412-00400-00400-490001, 00412-00400-00200-490001, 00412-00400-00300-490001, 00412-00400-00500-490001, 00412-00400-00100-490001
299	Hamilton, <i>et al.</i> , Dorothy	1	361.46	1 & 2	00196-00100-00100-490001, 00196-00100-00200-490001, 00196-00100-00300-500001, 00196-00100-00100-490001, 00196-00100-00200-490001, 00196-00100-00300-500001, 00331-00100-00100-490001, 00331-00100-00200-500001
302	Harding, Annie	1	5.07	2	00196-00100-00200-490001
281	Humphrey, <i>et al.</i> , Emily	1	69070.60	2	00179-00300-02300-500300, 00179-00300-02300-500400, 00179-00300-02300-500500, 00179-00300-02300-500700, 00179-00300-02300-500800, 00179-00300-02300-500900, 00179-00300-02300-501000, 00179-00300-02300-501200, 00179-00300-02300-501300, 00179-00300-02300-501400, 00179-00300-01600-500001, 00179-00300-01500-500001, 00179-00300-02300-501500, 00179-00300-02300-501600, 00179-00300-02300-501800, 00179-00300-02300-501700, 00179-00300-01400-500001, 00179-00300-02300-500100, 00179-00300-02300-500200, 00179-00300-02300-501900, 00179-00300-02300-502000, 00179-00300-02300-502100,

**Moody NWR Expansion Proposal (Alternative C)
Land Ownership List**

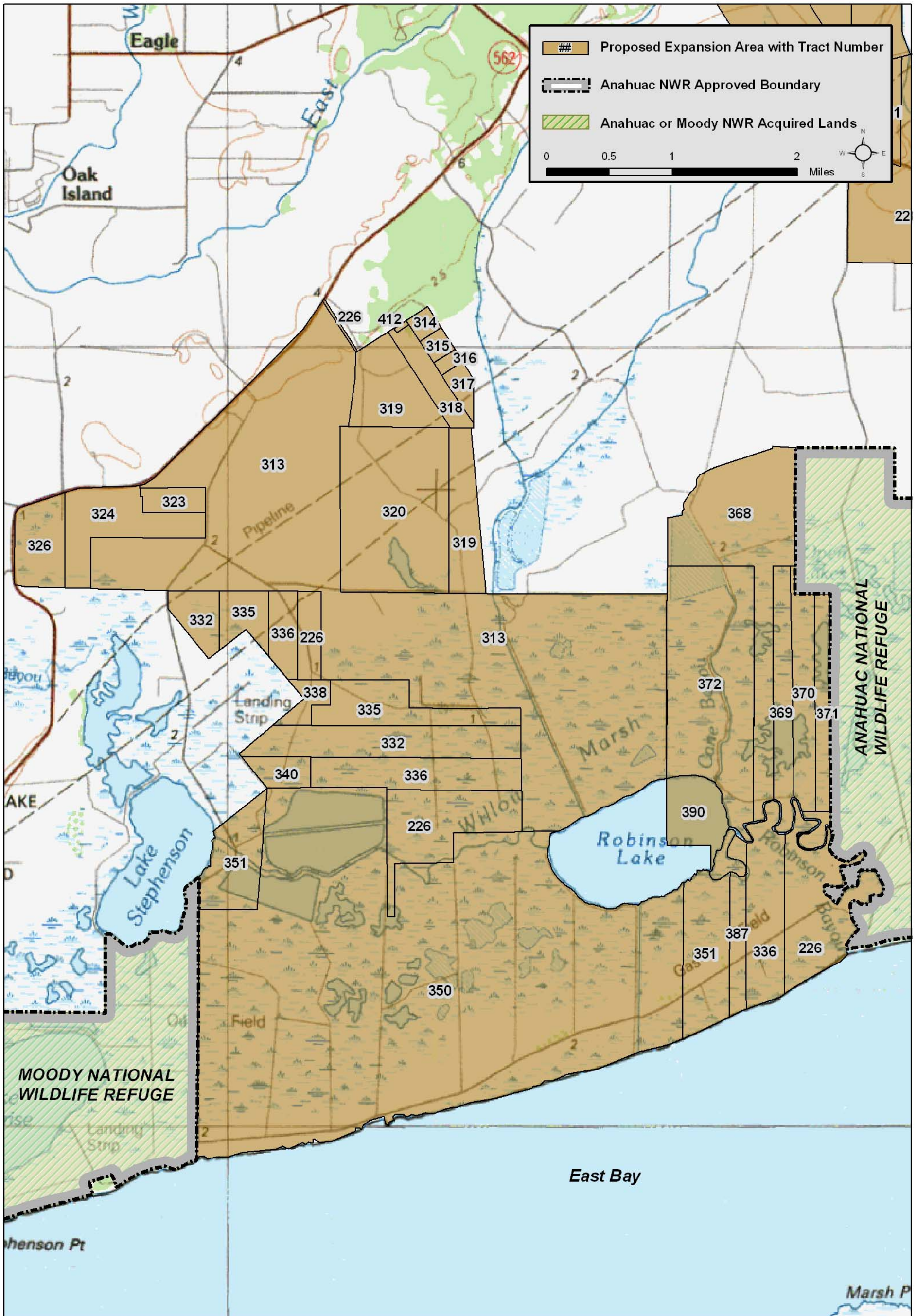
TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
281	Humphrey, <i>et al.</i> , Emily CONTINUED	1	69070.60	2	00179-00300-02300-502200, 00179-00300-02300-500600, 00179-00300-02300-502300, 00179-00300-02300-502400, 00179-00300-02300-502500, 00179-00300-02300-502700, 00179-00300-02300-502800, 00179-00300-02300-502900, 00179-00300-02300-503000, 00179-00300-02300-503100, 00179-00300-02300-501100, 00179-00300-02300-503200, 00179-00300-02300-503300, 00179-00300-02300-503400, 00179-00300-02300-503500, 00179-00300-02300-503600, 00179-00300-02100-500001, 00179-00300-02200-500001, 00179-00300-02300-503700, 00179-00300-02300-503800, 00179-00300-02300-503900, 00179-00300-02300-504000, 00179-00300-01700-500001, 00179-00300-02000-500001, 00179-00300-01800-500100, 00179-00300-01900-500001, 00179-00300-01800-500001, 00179-00300-02300-504100
208	Jackson, <i>et al.</i> , Felix	1	2974.50	1 & 2	00375-00200-00100-440001, 00371-00100-00100-440001, 00373-00200-00100-440001, 00376-00100-00100-440001, 00362-00200-00100-440001, 00362-00200-00100-440001, 00357-00100-00100-310001, 00357-00100-00200-310001, 00469-00100-00200-490001, 00469-00100-00100-490001, 00469-00100-00300-490001, 00469-00100-00400-490001, 00195-00100-00200-420001, 00195-00100-00300-420001, 00195-00100-00400-420001, 00195-00100-00100-420001
274	Jackson, <i>et al.</i> , Roscoe	1	269.32	2	00179-00300-01000-500001, 00179-00300-00800-501000,

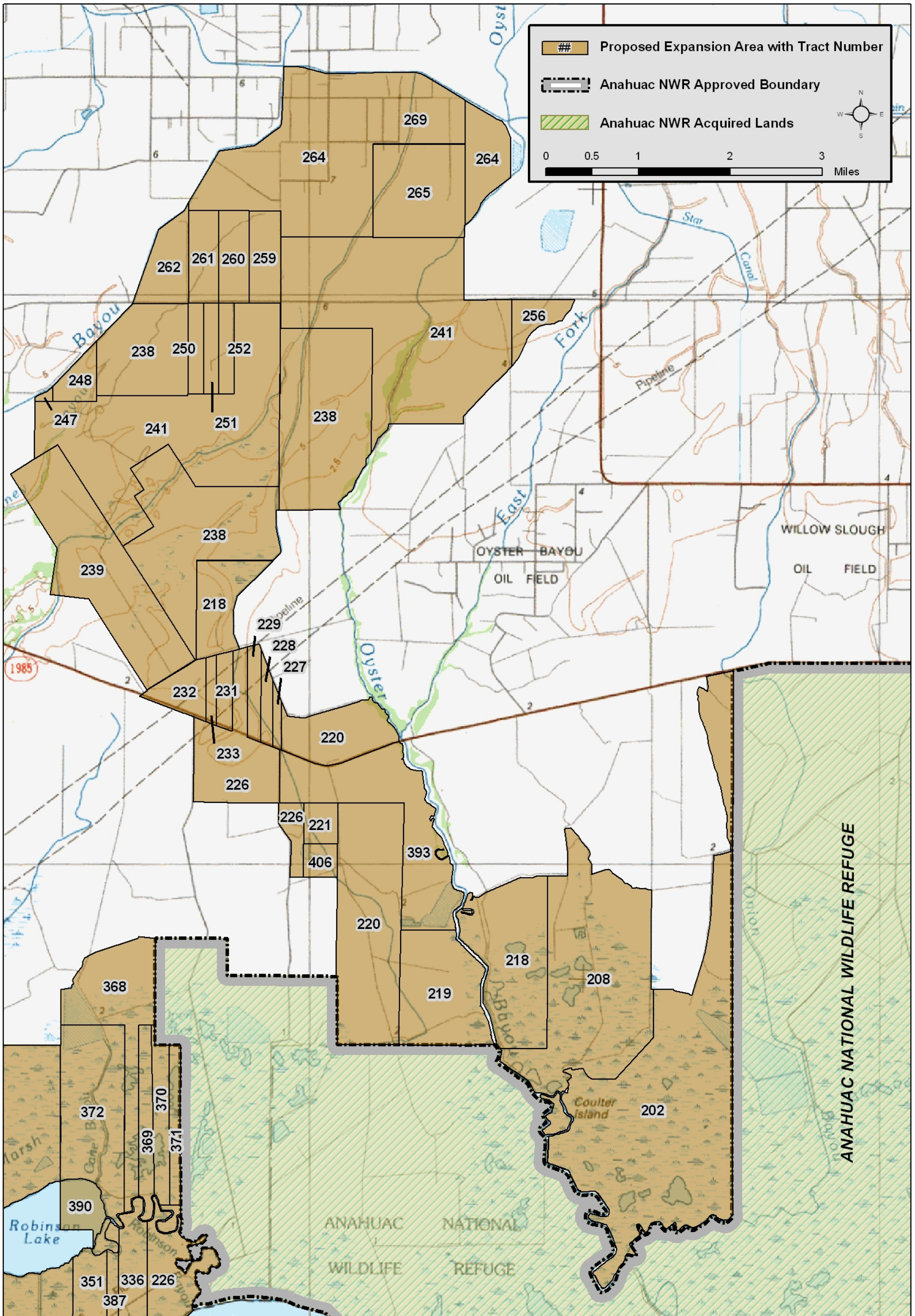
**Moody NWR Expansion Proposal (Alternative C)
Land Ownership List**

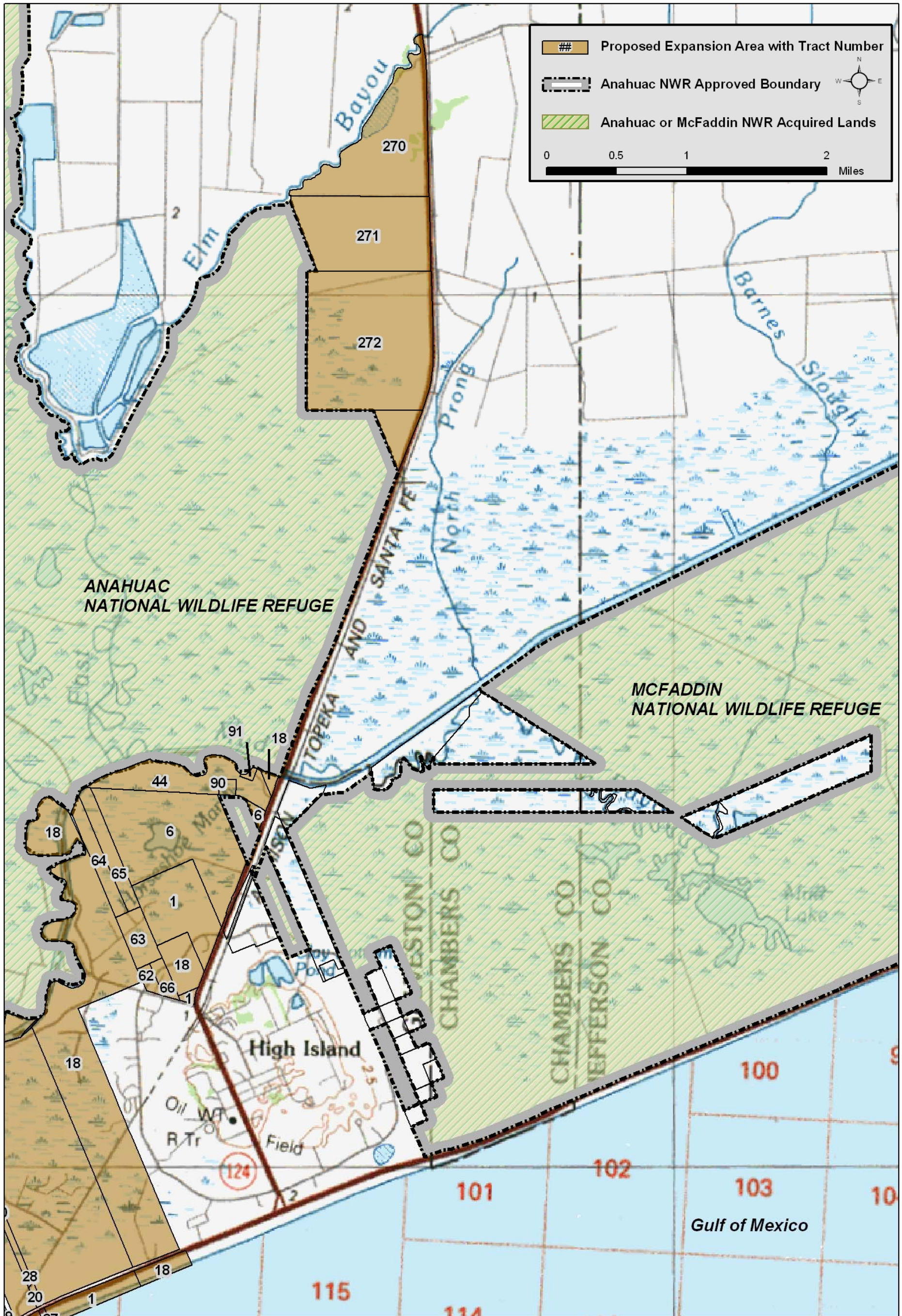
TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
274	Jackson, <i>et al.</i> , Roscoe CONTINUED	1	269.32	2	00179-00300-00800-502000, 00179-00300-00800-503000, 00179-00300-00800-504000, 00179-00300-01100-500001, 00179-00300-01200-500001, 00179-00300-00800-500001, 00179-00300-00900-500001, 00179-00300-01300-500001
296	Lerion Prope, <i>et al.</i> ,	1	522.00	1	00463-00100-00200-490001, 00463-00100-01000-490001, 00463-00100-00900-490001, 00463-00100-00800-490001, 00463-00100-00700-490001, 00463-00100-00500-490001, 00463-00100-00600-490001, 00463-00100-00300-490001, 00463-00100-00100-490100, 00463-00100-00400-490001, 00463-00100-00100-490001
288	Moody Foundation & Trust	1	742.44	1	00368-00300-00100-500001, 00217-00100-00100-500001, 00225-00100-00100-490001
287	Moody Foundation & Trust, <i>et al.</i> ,	1	108.60	1	00194-00100-00100-500001, 00192-00100-00100-500001
277	Nelson, Ben	1	3.00	2	00217-00400-00100-50001
298	Pyle Trust, Bernice	1	74.75	1	00366-00100-00100-490001
297	Pyle, <i>et al.</i> , Bernice	1	149.00	1	00366-00100-00100-490001, 00366-00100-00100-490100, 00366-00100-00100-460200
275	Robert Smith Estate, <i>et al.</i> ,	1	90.02	2	00218-00100-01200-500001, 00218-00100-01800-500001, 00218-00100-00900-500001, 00218-00100-01900-500001, 00218-00100-01000-500001, 00218-00100-00600-500001, 00218-00100-00800-500001, 00218-00100-00700-500001, 00218-00100-01100-500001, 00218-00100-00500-500001, 00218-00100-01500-500001, 00218-00100-01700-500001, 00218-00100-00200-500001, 00218-00100-01600-500001, 00218-00100-00100-500001, 00218-00100-00300-500001,

Moody NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
275	Robert Smith Estate, <i>et al.</i> , CONTINUED	1	90.02	2	00218-00100-01300-500001, 00218-00100-02000-500001, 00218-00100-02200-500001, 00218-00100-02300-500001
290	Sheldon, <i>et al.</i> , Zoe	1	165.18	1	00412-00200-00100-490001, 00412-00200-00200-490001, 00412-00200-00300-490001, 00412-00200-00200-490100, 00412-00200-00400-490001, 00412-00200-00500-490100
291	Valadez, <i>et al.</i> , Carla	1	86.25	1	00412-00300-00100-490001, 00412-00300-00100-490200, 00412-00300-00100-490100, 00412-00300-00100-490300, 00412-00300-00100-490210, 00412-00300-00100-490110
304	White, Melovee	1	48.00	1 & 2	00672-00000-00000-490001, 00670-00100-00100-490001
276	White, Ola Melovee	1	48.19	1	00218-00200-00100-50001
310	White, Modesto & Melovee	1	640.00	2	00243-00100-00100-410001, 00243-00100-00200-410001
309	White, Modesto & Ola	1	1382.00	1 & 2	00055-00100-00200-420001, 00055-00200-00200-420001, 00055-00100-00100-420001, 00055-00200-00100-420001, 00335-00100-00100-420001, 00335-00100-00200-420001
284	Wilborn, C Lloyd	1	145.59	2	00192-00200-00100-500001, 00194-00100-00300-500001
303	Wilborn, <i>et al.</i> , C.	1	5.12	2	00671-00100-00801-490001, 00671-00100-00803-490001, 00671-00100-00600-490001, 00671-00100-00802-490001, 00671-00100-00900-490001, 00671-00100-00200-490001, 00671-00100-00100-490001, 00671-00100-00700-490001
283	Young, Dorothy	1	137.26	2	00194-00100-00200-500001, 00196-00100-00300-500001, 00331-00100-00200-500001







Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
227	Abshier, Mary	2B	71.00	2	00027-00600-00000-320001
27	Binder, Scott	2C	3.00	2	0120-0009-0000-000
39	Black, S.R.	2C	101.00	2	0644-0002-0000-000
406	Blackwell, John	2B	179.83	1	00010-00700-00000-430001
90	Borrow, Claude	2D	9.00	2	0659-0001-0000-000
63	Bowers, Ruth	2D	50.00	2	6117-0000-0004-001
91	BP Pipeline Inc.	2D	5.17	2	0659-0003-0000-000
38	Brothers of Christian	2C	11.00	2	0644-0001-0000-000
350	Brown Foundation	2A	5430.00	1	00405-00100-00100-420001, 00211-00100-00100-420001, 00097-00200-00200-480001, 00099-00100-00400-480001, 00097-00100-00100-480001, 00415-00100-00100-490001, 00317-00100-00100-490001, 00359-00100-00100-490001, 00158-00100-00100-690001, 00203-00100-00100-490001, 00032-00100-00100-670001, 00200-00100-00100-490001, 00200-00100-00200-490001, 00201-00100-00100-490001, 00184-00100-00100-490001
351	Brown Foundation, <i>et al.</i> ,	2A	901.00	1	00207-00100-00300-490001, 00207-00100-00400-490001, 00207-00100-00200-490001, 00207-00100-00100-490001, 00099-00200-00200-480001, 00099-00200-00300-480001, 00099-00200-00100-480001
324	Carey, Nathan	2A	436.10	2	00021-02000-00100-420001, 00021-02000-00200-420001, 00021-02000-00300-420001, 00021-02000-00700-420001, 00021-02100-00100-420001, 00021-02100-00200-420001, 00021-02100-00300-420001, 00021-02100-00400-420001, 00021-02000-00800-420001, 00021-02000-00900-420001, 00021-02000-01000-420001,

Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
324	Carey, Nathan Continued	2A	436.10	2	00021-02000-01100-420001
42	Carmona, Frank	2C	31.00	2	0644-0005-0000-000, 0644-0005-0001-000
9	Carrutherrs, William	2C	10.00	2	0062-0002-0000-000
369	Citizens Bank	2A	201.00	1	00259-00300-00100-430001, 00006-00802-00000-430001, 00283-00300-00100-430001
220	Cline, Jared	2B	2178.00	1 & 2	00010-00400-00000-430001, 00027-00700-00000-320001
11	Cobbs, Phyllis	2C	40.00	2	0062-0004-0000-000
44	Cockburn Esate, Dorothy	2D	119.00	2	0659-0002-0000-000
219	Daniel Dror	2B	736.00	1	00010-00300-00000-430001
221	Dawson, Berta	2B	194.00	1	00010-00500-00000-430001
371	Dyer, Mary	2A	201.00	1	00259-00500-00100-430001, 00283-00500-00100-430001
21	Eastham, Genevieve	2C	9.00	2	0120-0003-0000-000
19	Edgar, Eunice	2C	1.00	2	0120-0001-0000-000
270	Edwards, W	2D	915.00	1	00302-00500-00100-300001
269	Exxon Mobil Corp	2B	1.00	2	00443-00200-00100-180001
313	Ezer, <i>et al.</i> , Charles	2A	4691.50	1 & 2	00384-00100-00200-420001, 00332-00100-00200-420001, 00211-00200-00200-420001, 00211-00200-00100-420001, 00392-00100-00100-430001, 00392-00100-00200-430001, 00258-00200-00100-430001, 00258-00200-00200-430001, 00403-00100-00200-420001, 00403-00100-00100-420001, 00404-00100-00200-420001, 00404-00100-00100-420001, 00402-00100-00200-420001, 00402-00100-00100-420001, 00397-00100-00200-420001, 00397-00100-00100-420001, 00385-00100-00100-420001, 00385-00100-00200-420001, 00332-00100-00100-420001, 00343-00100-00100-420001, 00323-00100-00100-420001, 00323-00100-00000-420001, 00343-00100-00200-420001,

Anahuac NWR Expansion Proposal (Alternative C)

Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
313	Ezer, <i>et al.</i> , Charles CONTINUED	2A	4691.50	1 & 2	00384-00100-00100-420001, 00021-00200-00100-420001, 00021-00200-00200-420001
272	Finch, Myrna	2D	639.00	1	00296-00100-00100-300001
368	Fitzgerald, Jewel	2A	1777.00	1	00259-00200-00100-430001, 00006-00803-00000-430001, 00006-00700-00000-320001, 00283-00200-00100-430001
372	Fitzgerald, <i>et al.</i> , Stephen	2A	1038.57	1	00006-00804-00000-430001, 00006-00804-00100-430001, 00006-00804-00400-430001, 00006-00804-00700-430001, 00006-00804-00600-430001, 00006-00804-00500-430001, 00006-00804-00200-430001, 00006-00804-00300-430001, 00258-00300-00700-430001, 00259-00100-00500-430001, 00259-00100-00300-430001, 00259-00100-00200-430001, 00259-00100-00100-430001, 00259-00100-00400-430001, 00258-00300-00800-430001, 00258-00300-00500-430001, 00258-00300-00200-430001, 00258-00300-00100-430001, 00258-00300-00600-430001, 00258-00300-00300-430001, 00258-00300-00400-430001, 00259-00100-00600-430001, 00259-00100-00800-430001, 00259-00100-00700-430001, 00392-00200-00200-430001, 00283-00100-00500-430001, 00283-00100-00600-430001, 00283-00100-00300-430001, 00283-00100-00200-430001, 00283-00100-00100-430001, 00283-00100-00400-430001, 00283-00100-00700-430001, 00283-00100-00800-430001, 00392-00200-00500-430001, 00392-00200-00600-430001, 00392-00200-00300-430001, 00392-00200-00800-430001, 00392-00200-00100-430001,

Anahuac NWR Expansion Proposal (Alternative C)

Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
372	Fitzgerald, <i>et al.</i> , Stephen CONTINUED	2A	1038.57	1	00392-00200-00400-430001, 00392-00200-00700-430001, 00392-00200-00200-430001, 00392-00200-00800-430001, 00392-00200-00700-430001, 00392-00200-00600-430001, 00392-00200-00100-430001, 00392-00200-00300-430001, 00392-00200-00400-430001, 00392-00200-00500-430001
14	Freeman, Eugene	2C	90.00	2	0062-0005-0002-000
260	Fugger, Edward	2B	213.00	2	00447-00100-00300-270001
326	Gau, Henry	2A	202.00	1 & 2	00021-02700-00100-420001, 00160-00100-00100-420001
323	Gau, <i>et al.</i> , LC	2A	64.77	2	00021-02000-01600-420001, 00021-02000-00600-420001, 00021-02000-00500-420001, 00021-02000-00400-420001
318	Gill Estate, <i>et al.</i> ,	2A	126.00	2	00161-00200-00400-330001, 00161-00200-01300-330001, 00161-00200-01200-330001, 00161-00200-01100-330001, 00161-00200-00300-330001, 00161-00200-00600-330001, 00161-00200-00700-330001, 00161-00200-00500-330001, 00161-00200-00900-330001, 00161-00200-00800-330001, 00161-00200-00200-330001, 00161-00200-01000-450001, 00161-00200-00100-330001
66	Gordon, John	2D	8.00	2	6117-0000-0019-001
319	Gorton, Louise	2A	455.00	2	00161-00900-00100-330001, 00256-00100-00600-420001
261	Haynes, J	2B	214.00	2	00447-00100-00200-270001
338	Henry, Peggy	2A	13.00	1	00254-00200-00100-420001
1	Holt Partners LTD	2C & 2D	3992.00	1 & 2	0023-0001-0001-000, 3805-0000-0002-005, 3093-0007-0000-013, 0188-0001-0001-000, 0166-0002-0001-000, 0166-0001-0000-010, 0165-0001-0001-000, 0074-0001-0001-000, 0061-0001-0001-000,

Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
1	Holt Partners LTD CONTINUED	2C & 2D	3992.00	1 & 2	0062-0006-0001-000, 0073-0001-0001-000
41	Hoppe, Viola	2C	10.00	2	0644-0004-0000-000
335	Hughes, <i>et al.</i> , W.E.	2A	383.00	1	00254-00600-00200-420001, 00254-00600-00300-420001, 00254-00600-00100-420001, 00254-00600-00400-420001, 00254-00600-00500-420001, 00255-00100-00500-420001, 00255-00100-00300-420001, 00255-00100-00200-420001, 00255-00100-00100-420001, 00257-00100-00100-420001, 00257-00100-00300-420001, 00257-00100-00500-420001, 00257-00100-00400-420001
316	Humphrey, Will	2A	15.00	2	00161-00400-00100-330001
12	J & B Sausage Company Inc.	2C	30.00	2	0062-0005-0000-000
231	Jackson, James	2B	72.00	2	00027-00100-00100-320001, 00027-00100-00200-320001
233	Jackson, William	2B	85.00	2	00027-00400-00200-320001
317	Jackson Family, <i>et al.</i> , %Elga Jackson	2A	10.11	2	00161-00500-00300-330001, 00161-00500-00400-330001, 00161-00500-00100-330001, 00161-00500-00200-330001, 00161-00500-00600-033001, 00161-00500-00500-330001, 00161-00500-00700-033001,
218	Jackson Family, <i>et al.</i> , %Guy C Jackson III	2B	2586.35	2	00010-00100-00100-430001, 00010-00100-00200-430001, 00010-00100-00300-430001, 00010-00100-00400-430001, 00027-00900-00100-320001, 00027-00900-00200-320001, 00027-00900-00300-320001, 00027-00900-00400-320001, 00027-00900-00500-320001
208	Jackson, <i>et al.</i> , Felix	2B	2974.50	1 & 2	00375-00200-00100-440001, 00371-00100-00100-440001, 00373-00200-00100-440001, 00376-00100-00100-440001, 00362-00200-00100-440001, 00362-00200-00100-440001, 00357-00100-00100-310001,

Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
208	Jackson, <i>et al.</i> , Felix CONTINUED	2B	2974.50	1 & 2	00357-00100-00200-310001, 00469-00100-00200-490001, 00469-00100-00100-490001, 00469-00100-00300-490001, 00469-00100-00400-490001, 00195-00100-00200-420001, 00195-00100-00300-420001, 00195-00100-00400-420001, 00195-00100-00100-420001
229	Jackson, James & Granberry Family	2B	96.00	2	00027-00500-00200-320300, 00027-00500-00200-320400, 00027-00500-00200-320200, 00027-00500-00200-320001
250	Jenkins, B.	2B	107.00	2	00127-00100-00200-270001
251	Jenkins, W	2B	107.00	2	00127-00100-00300-270001
252	Jenkins Family	2B	108.00	2	00127-00100-00500-270001, 00127-00100-00400-270001, 00127-00100-00100-270001
22	Johnson, Sidney	2C	30.00	2	0120-0004-0000-000
314	Johnson, <i>et al.</i> , Madison	2A	3.00	2	00161-00700-00200-330001, 00161-00700-00300-330001, 00161-01800-00500-330001, 00161-00700-00100-330001, 00161-00700-00500-330001, 00161-00700-00400-330001
20	Kane, John	2C	75.00	2	0120-0002-0000-000, 0120-0008-0000-000
8	Keyes, Carolyn	2C	10.00	2	0062-0001-0000-000
64	Labelle Properties Ltd.	2D	44.00	2	6117-0000-0006-000
256	Labelle Properties Ltd., <i>et al.</i> ,	2B	8183.77	1 & 2	300275-001000-4, 300275-001002-0, 300273-002000-8, 300273-001000-9, 300273-002002-4, 300500-001000-5, 300500-002000-4, 300500-002002-0, 300274-001000-7, 300274-002000-6, 300274-002002-2, 300272-001000-1, 300272-003000-9, 300272-004000-8, 300272-004002-4, 300272-005000-7,

Anahuac NWR Expansion Proposal (Alternative C)
Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
256	Labelle Properties Ltd., <i>et al.</i> , CONTINUED	2B	8183.77	1 & 2	300272-006000-6, 300271-001000-3, 300271-002000-2, 300271-002002-8 00148-00100-00100-280001, 00148-00100-00100-280100, 00148-00100-00200-280001, 00148-00100-00200-280100, 00148-00100-00200-280200, 00148-00100-00200-280300, 00148-00100-00400-280001, 00148-00100-00600-280001, 00148-00100-00300-280001, 00148-00100-00500-280001, 300008-002000-8, 300008-002002-4, 300008-003000-7, 300730-001000-8, 300730-001050-3, 300730-002000-7, 300729-001000-0, 300729-001050-5, 300729-002000-9, 300504-001000-7, 300504-001050-2, 300504-002000-6, 300503-001000-9, 300503-001050-4, 300503-002000-8, 300299-001000-4, 300299-001002-0, 300299-002000-3,
202	Lagow Family	2B	4306.93	1 & 2	00349-00100-00300-310001, 00349-00100-00500-310001, 00349-00100-00400-310001, 00030-00500-00000-310100, 00030-00500-00200-310001, 00030-00500-00000-310200, 00030-00500-00300-310001, 00030-00500-00000-310300, 00030-00500-00400-310001, 00373-00100-00300-440001, 00373-00100-00500-440001, 00373-00100-00400-440001, 00373-00100-00100-440001, 00374-00200-00400-440001, 00374-00200-00500-440001,

Anahuac NWR Expansion Proposal (Alternative C)

Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
202	Lagow Family CONTINUED	2B	4306.93	1 & 2	00374-00200-00300-440001, 00374-00200-00100-440001, 00372-00100-00300-440001, 00372-00100-00500-440001, 00372-00100-00400-440001, 00375-00100-00300-440001, 00375-00100-00500-440001, 00375-00100-00400-440001, 00362-00300-00300-440001, 00362-00300-00500-440001, 00362-00300-00400-440001, 00362-00300-00100-440001, 00362-00300-00200-720001, 00376-00200-00300-440001, 00376-00200-00500-440001, 00376-00200-00400-440001, 00361-00300-00300-440001, 00361-00300-00500-440001, 00361-00300-00400-440001
370	Lansford, B	2A	201.00	1	00259-00400-00100-430001, 00283-00400-00100-430001, 00006-00801-00000-430001
259	Mayes, Ella	2B	211.00	2	00447-00100-00100-270001
62	McLean, Marr	2D	8.00	2	6117-0000-0001-001
65	Mecom, John	2D	50.00	2	6117-0000-0011-000
320	Meredith, Bonnie	2A	724.88	2	00021-00100-00100-420001
265	Middleton, David	2B	640.00	2	00137-00200-00200-180001
241	Middleton, John	2B	5133.00	2	00429-00100-00400-270001, 00446-00100-00100-270001, 00132-00100-00100-270001, 00444-00100-00100-270001, 00131-00100-00100-270001, 00127-00200-00100-270001, 00128-00100-00100-270001, 00130-00100-00100-270001, 00301-00100-00100-270001, 00456-00100-00100-270001
264	Middleton, Triphene & John	2B	3166.78	2	00449-00100-00000-180001, 00138-00100-00100-180001, 00443-00100-00100-180001, 00136-00100-00100-180001, 00445-00100-00100-180001, 00445-00100-00200-180001
239	Middleton, <i>et al.</i> , John	2B	1629.00	2	00034-04801-00000-330001, 00034-04801-00200-330001,

Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

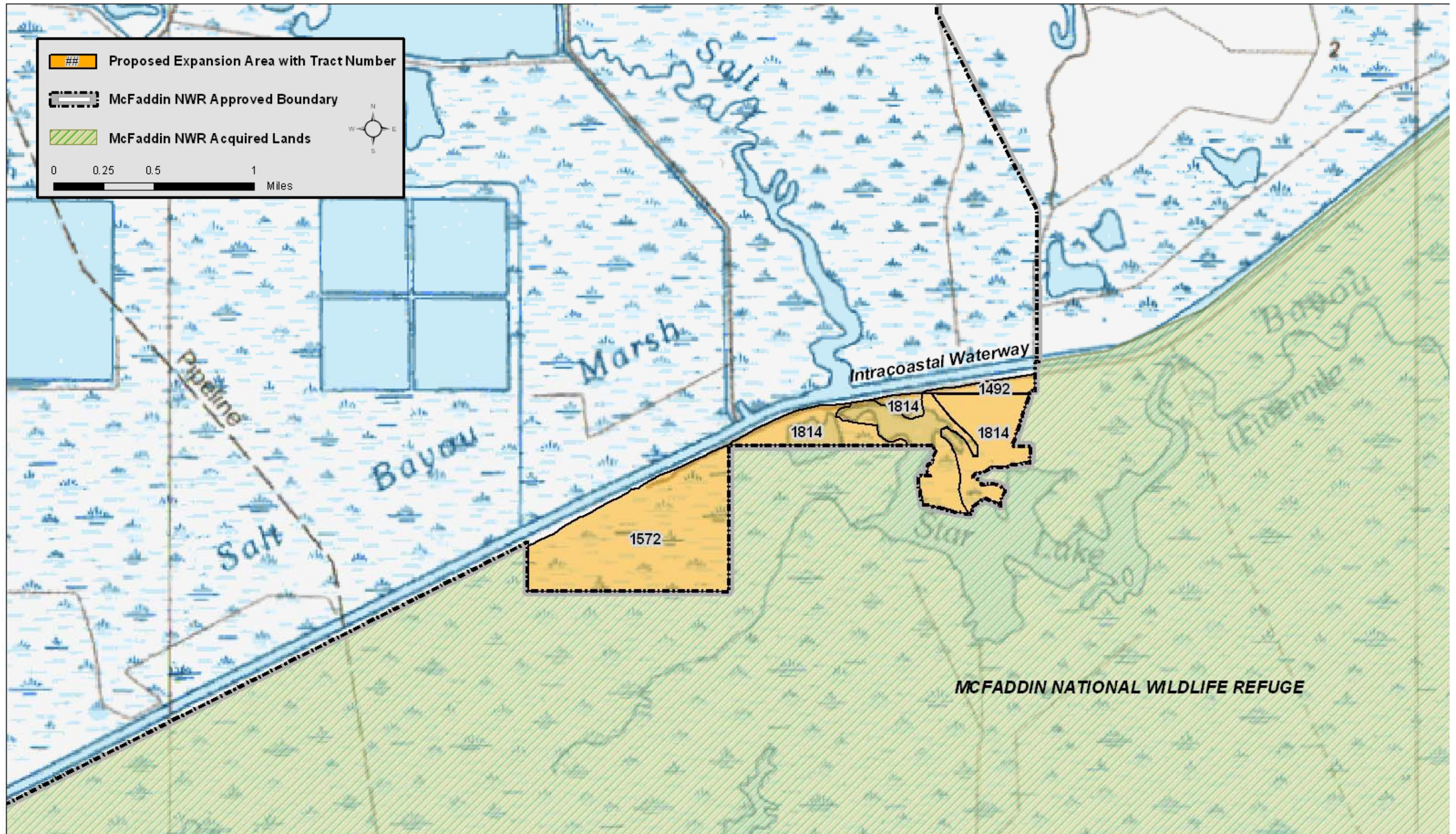
TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
239	Middleton, <i>et al.</i> , John CONTINUED	2B	1629.00	2	00034-04900-00100-330001, 00034-04900-00300-320001
238	Middleton, John & White, James	2B	3664.00	2	00429-00100-00100-270001, 00429-00100-00500-270001, 00453-00100-00100-270001, 00453-00100-00300-270001, 00450-00100-00100-270001, 00450-00100-00300-270001, 00452-00100-00100-270001, 00452-00100-00200-270001, 00451-00100-00100-270001, 00451-00100-00300-270001
28	Nini, Betty Minter	2C	1.00	2	0120-0010-0000-000
315	North, <i>et al.</i> , Adelia	2A	25.00	2	00161-00300-00100-330001, 00161-00300-00300-330001, 00161-00300-00200-330001
336	Richardson, Joyce	2A	777.00	1	00254-00400-00100-420001, 00186-00100-00200-480001, 00257-00300-00100-420001, 00255-00300-00100-420001
340	Richardson Fly Revocable Trust	2A	66.67	1	00254-00400-00100-420001
24	Rink, Wilson	2C	30.00	2	0120-0006-0000-000
412	Roberts, Virgie	2A	0.50	2	00161-01800-00500-330001
390	Robinson Lak	2A	250.00	1	00392-00400-00100-430001
393	Rowe, Mary & Walden, Wright	2B	846.00	1	00010-00200-00000-430001, 00010-00200-00200-430001, 00010-00200-00100-430001, 00027-01000-00000-320001, 00027-01000-00100-320001, 00027-01000-00200-320001
228	Schott, <i>et al.</i> , John	2B	96.00	2	00027-00200-00200-320100, 00027-00200-00200-320001, 00027-00200-00200-320200
387	Schwarz, Christian	2A	94.00	1	00186-00100-00100-480001

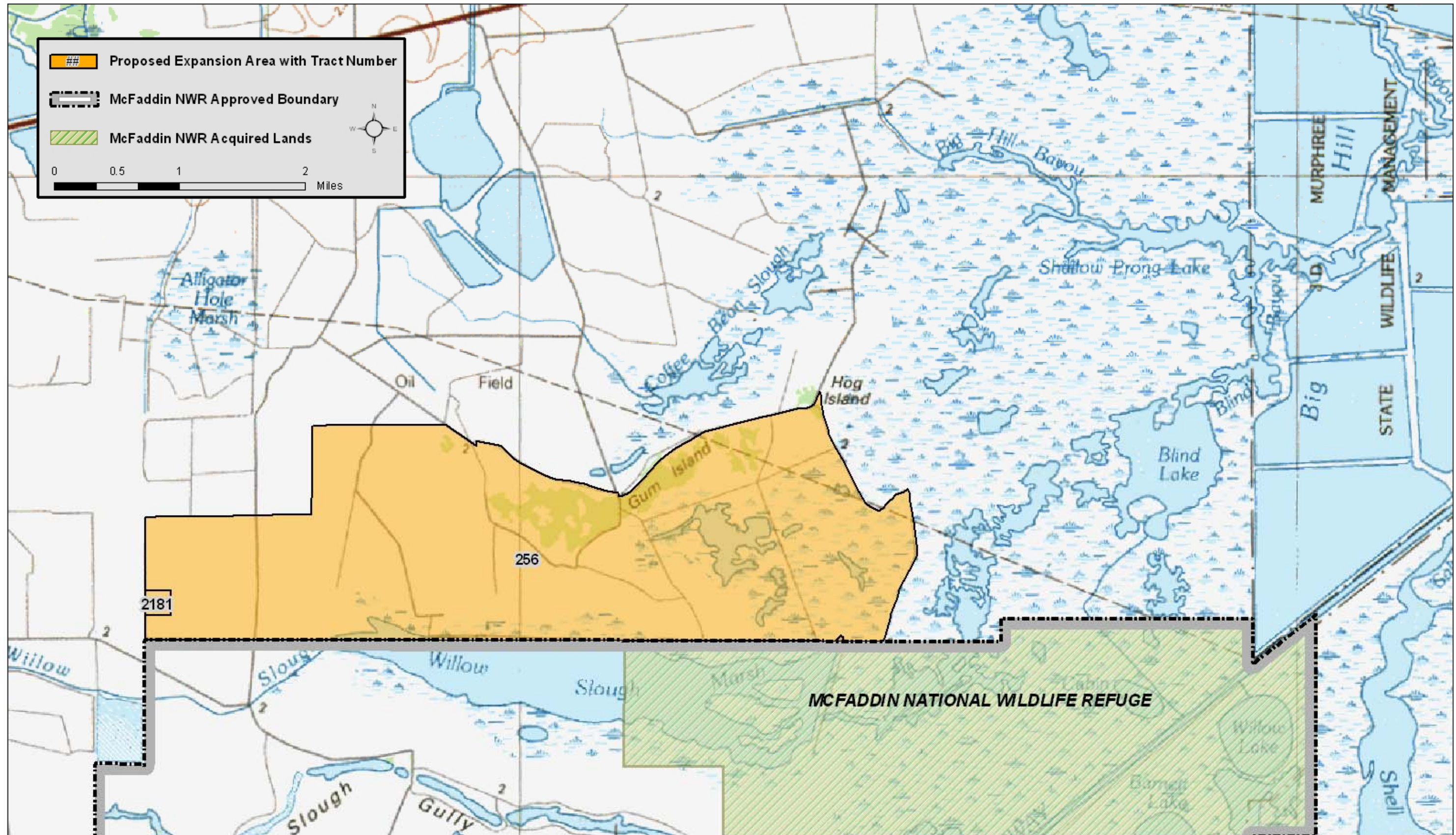
Anahuac NWR Expansion Proposal (Alternative C) Land Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
332	Schwarz, <i>et al.</i> , Carroll	2A	572.14	1	00254-00300-00100-420100, 00254-00300-00100-420001, 00254-00300-00100-420110, 00254-00300-00200-420001, 00254-00300-00200-420100, 00254-00300-00200-420110, 00255-00200-00100-420001, 00255-00200-00100-420100, 00255-00200-00100-420200, 00257-00200-00100-420100, 00257-00200-00100-420001
232	Smith, Max	2B	170.00	2	00027-00100-00000-320001, 00027-00400-00100-320001, 00409-00200-00100-320100, 00409-00200-00100-320001
6	Smith, Estate, Charlotte	2D	604.50	1 & 2	0053-0054-0000-000, 3093-0008-0000-100, 3093-0006-0000-050, 3093-0005-0000-100
10	Spencer, Eugene	2C	20.00	2	0062-0003-0000-000
247	Stanley, Octavia	2B	301.98	2	00129-00100-00200-270001
40	Stubbs Family Limited	2C	10.00	2	0644-0003-0000-000
18	Taylor, Betty	2C & 2D	1443.74	1 & 2	0081-0001-0000-003, 0144-0001-0000-003, 0188-0001-0000-004, 3805-0000-0002-004, 0066-0002-0000-003, 0041-0001-0000-004
248	Tinnerman, Trustee, William II	2B	316.46	2	00129-00100-00100-270001
23	Topp, Evadel	2C	10.00	2	0120-0005-0000-000
84	Unknown owner	2C	0.00	1	UNKNOWN
2	Voorheis, Alexis	2C	1.00	2	0023-0002-0000-000
25	Watts, William	2C	157.00	2	0120-0007-0000-000
262	White, Betty Ann	2B	223.90	2	00133-00100-00100-270001
271	White, William	2D	232.00	1	00355-00100-00300-300001

**Anahuac NWR Expansion Proposal (Alternative C)
Land Ownership List**

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
226	Wilborn, Carroll	2A	1856.60	1 & 2	00027-00800-00000-320001, 00006-00200-00100-320001, 00006-00100-00100-320001, 00231-00100-00000-330001, 00186-00300-00100-480001, 00185-00100-00100-480001, 00255-00400-00100-420001, 00027-00300-00000-320001, 00254-00100-00100-420001, 00257-00400-00100-420001
226	Wilborn, Carroll	2B	1856.60	1 & 2	00027-00800-00000-320001, 00006-00200-00100-320001, 00006-00100-00100-320001, 00231-00100-00000-330001, 00186-00300-00100-480001,
226	Wilborn, Carroll CONTINUED	2B	1856.60	1 & 2	00185-00100-00100-480001, 00255-00400-00100-420001, 00027-00300-00000-320001, 00254-00100-00100-420001, 00257-00400-00100-420001
13	Wisrodt, A.V.	2C	40.00	2	0062-0005-0001-000





McFaddin NWR Expansion Proposal (Alternative C) - Ownership List

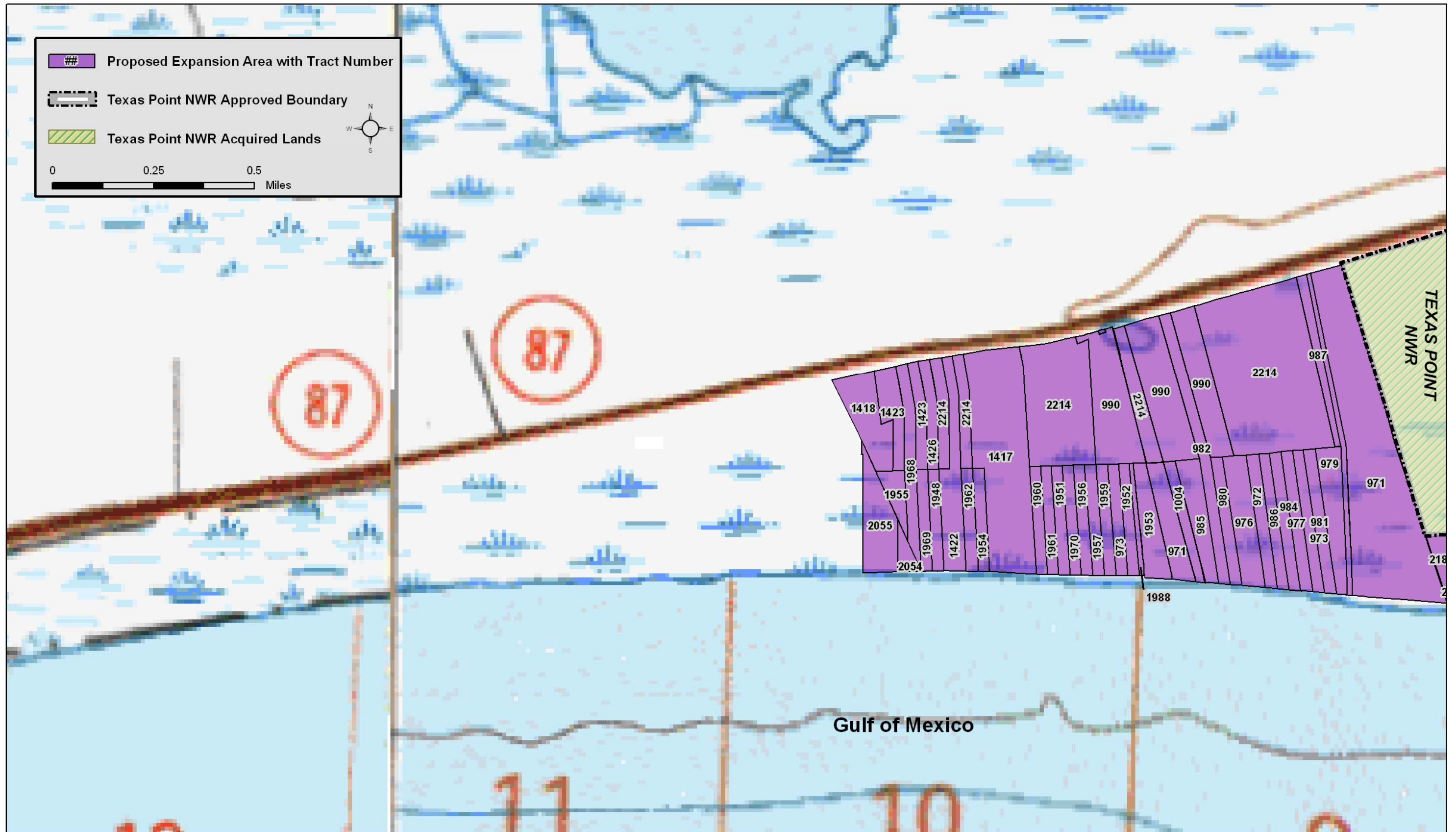
TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
5	Amoco Production Co	3A	77.00	1	0041-0002-0000-000, 2120-0000-0023-000, 2120-0000-0013-000, 2120-0000-0002-000, 2120-0000-0004-000, 2120-0000-0005-000, 2120-0000-0009-001, 2120-0000-0010-000
398	Barrow, Rueben	3A	863.00	1	00353-00300-00100-450001
88	BP American Production Co.	3A	9.71	1	3093-0007-0000-100
53	Continental Oil	3A	10.00	1	2120-0000-0015-000
1	Holt Partners LTD	3A	3992.00	1 & 2	0023-0001-0001-000, 3805-0000-0002-005, 3093-0007-0000-013, 0188-0001-0001-000, 0166-0002-0001-000, 0166-0001-0000-010, 0165-0001-0001-000, 0074-0001-0001-000, 0061-0001-0001-000, 0062-0006-0001-000, 0073-0001-0001-000
1804	Jefferson County	3A	55.75	1	300553-001000-4, 300553-006000-9, 300936-032000-4
256	Labelle Properties Ltd., <i>et al.</i> ,	3C	8183.77	1 & 2	00148-00100-00100-280001, 00148-00100-00100-280100, 00148-00100-00200-280001, 00148-00100-00200-280100, 00148-00100-00200-280200, 00148-00100-00200-280300, 00148-00100-00400-280001, 00148-00100-00600-280001, 00148-00100-00300-280001, 00148-00100-00500-280001, 300008-002000-8, 300008-002002-4, 300008-003000-7, 300730-001000-8, 300730-001050-3, 300730-002000-7,

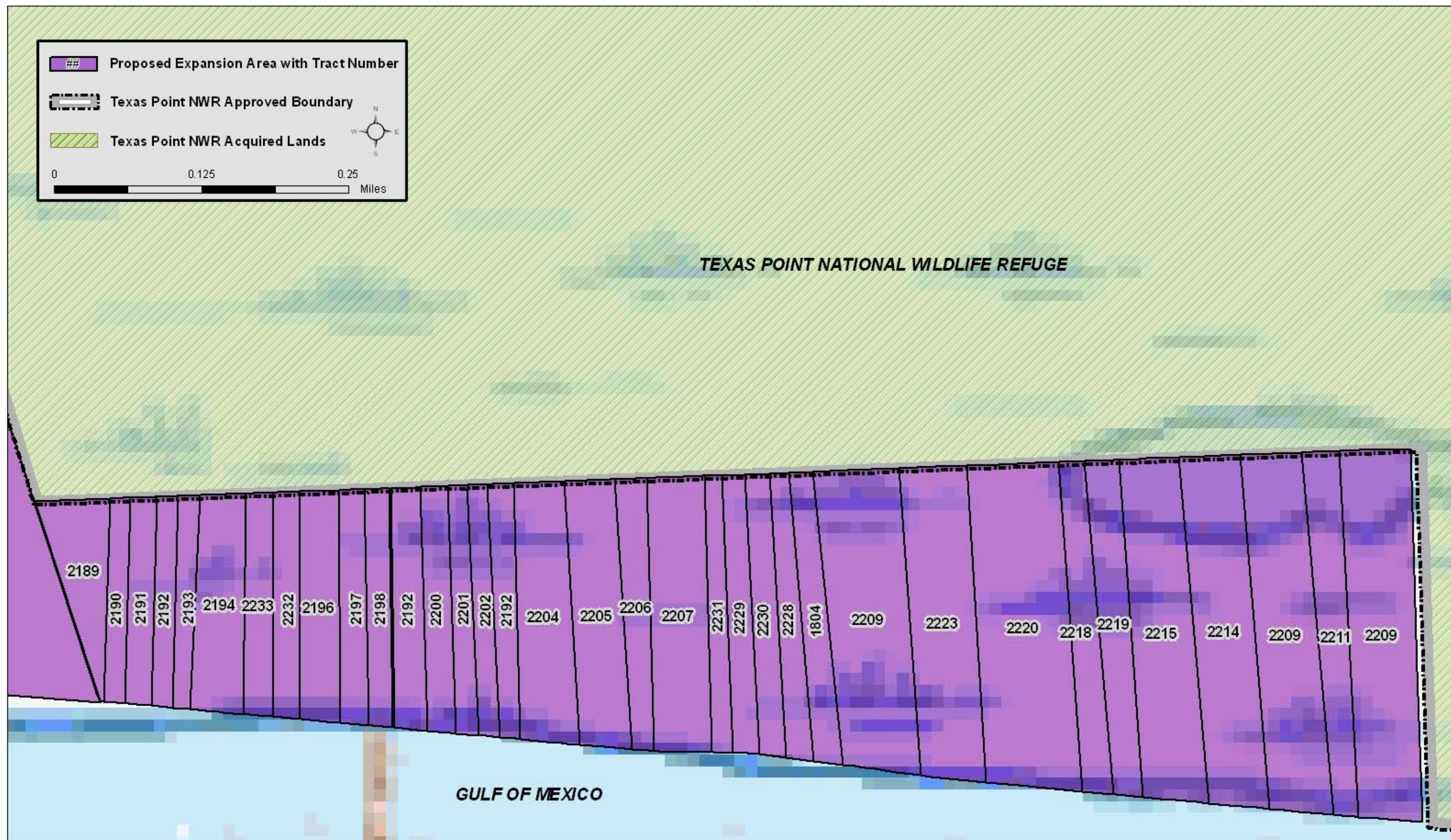
McFaddin NWR Expansion Proposal (Alternative C) - Ownership List

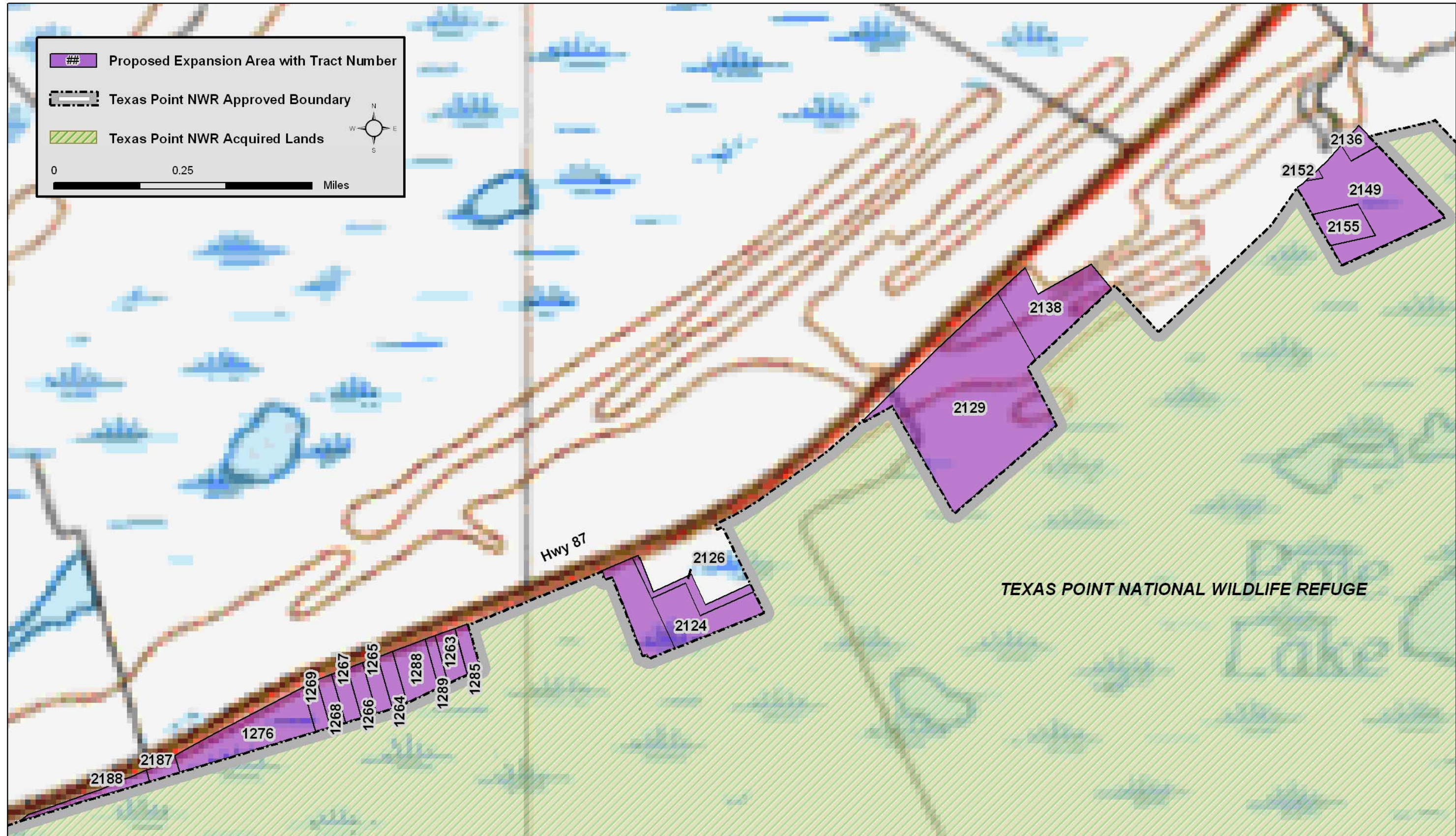
TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
256	Labelle Properties Ltd., <i>et al.</i> , CONTINUED	3C	8183.77	1 & 2	300729-001000-0, 300729-001050-5, 300729-002000-9, 300504-001000-7, 300504-001050-2, 300504-002000-6, 300503-001000-9, 300503-001050-4, 300503-002000-8, 300299-001000-4, 300299-001002-0, 300299-002000-3, 300275-001000-4, 300275-001002-0, 300273-002000-8, 300273-001000-9, 300273-002002-4, 300500-001000-5, 300500-002000-4, 300500-002002-0, 300274-001000-7, 300274-002000-6, 300274-002002-2, 300272-001000-1, 300272-003000-9, 300272-004000-8, 300272-004002-4, 300272-005000-7, 300272-006000-6, 300271-001000-3, 300271-002000-2, 300271-002002-8
1910	Moody, <i>et al.</i> , Robert	3A	212.00	1	300629-001000-2, 300629-001005-1, 300629-001010-1, 300629-001015-0, 300629-001020-0, 300629-001025-9, 300629-001030-9, 300629-001035-8
396	Phelan, A.	3A	163.00	1	00462-00100-00100-450001, 00461-00100-00100-450001
1572	Phelan, Mickey	3B	593.00	1	300358-001000-8, 300358-002000-7
1492	Pipkin, Bruce	3B	301.00	1	300285-001000-3

McFaddin NWR Expansion Proposal (Alternative C) - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
1814	Pipkin, <i>et al.</i> , Bruce	3B	363.00	1	300560-001000-9
2181	Polk, James	3C	25.00	1	300008-001000-9
6	Smith, Estate, Charlotte	3A	604.50	1 & 2	0053-0054-0000-000, 3093-0008-0000-100, 3093-0006-0000-050, 3093-0005-0000-100
18	Taylor, Betty	3A	1443.74	1 & 2	0081-0001-0000-003, 0144-0001-0000-003, 0188-0001-0000-004, 3805-0000-0002-004, 0066-0002-0000-003, 0041-0001-0000-004
46	Texaco	3A	43.10	1	2120-0000-0003-000
49	Vastar Resources, Inc.	3A	16.00	1	2120-0000-0008-000, 2120-0000-0019-000
1911	White, William	3A	1427.43	1 & 2	300398-002000-3
399	Yates, Robert	3A	124.00	1	00462-00300-00100-450001, 00461-00300-00100-450001

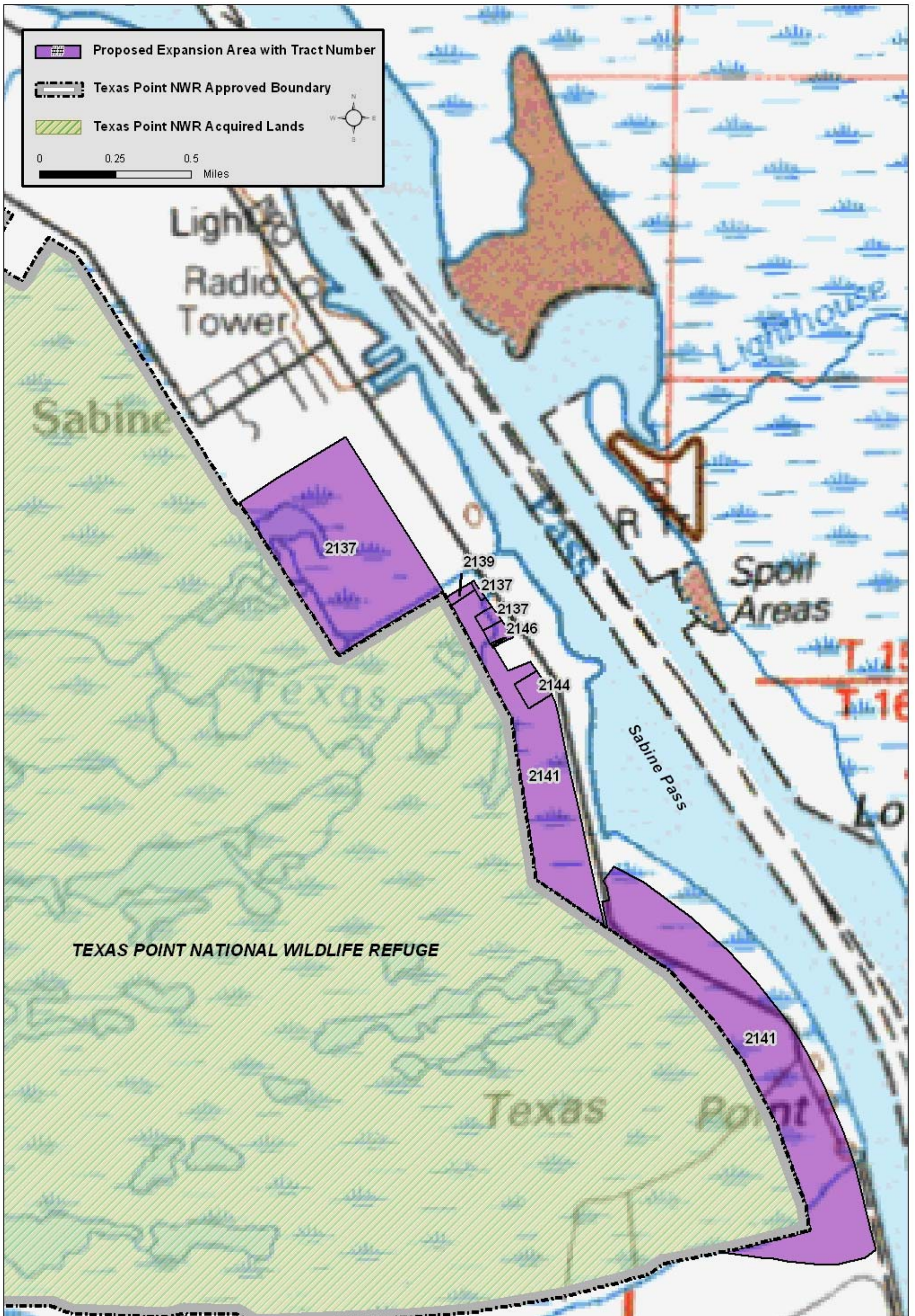








Texas Point National Wildlife Refuge



Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
972	Adair, Maynard	4A	6.00	2	300095-002000-5
2198	Alvord, Jerry	4B	3.00	1	300936-045000-9
1266	Baker, Robert & Daniel	4C	12.00	1	300167-086000-1
1268	Ballard, C.H.	4C	12.00	1	300167-088000-9
984	Barber, Wayne	4A	6.00	2	300095-014000-1
982	Bass & Hayes	4A	13.00	2	300095-012000-3, 300095-013000-2
1955	Bell, Johnnie	4A	8.00	2	300713-009000-6
985	Benoit, Kermit	4A	9.00	2	300095-015000-0
2149	Bergeron, Richard	4C	32.83	1	300167-036000-2
986	Binagia, C.V.	4A	6.00	2	300095-016000-9
1948	Bishop, Ted	4A	5.00	2	300713-002000-3
2220	Blackwell, Ann	4B	20.09	1	300936-029000-9, 300936-057000-4, 300936-030000-6
1423	Boudreaux, et al., Joey	4A	13.00	2	300192-010000-0, 300192-011000-9, 300192-012000-8, 300713-027000-4, 300713-028000-3
2136	Cemetary	4C	6.00	1	300167-030000-8
2196	Clarkson, Burton	4B	5.77	1	300936-047000-7
1988	Clayton, Robert	4A	2.00	2	300713-042000-5
1269	Cormier, Veo Davic	4C	12.00	1	300167-089000-8
2219	Dejohn, Danny	4B	2.42	1	300936-065000-4
2187	Doornbos Heirs	4C	30.00	1 & 2	300167-093000-2
1951	Downs, Robert	4A	6.00	2	300713-005000-0
1417	Drennan, Brady	4A	41.00	2	300192-004000-8, 300713-020000-1, 300713-019000-4, 300713-018000-5, 300192-007000-5, 300192-006000-6, 300713-001000-4, 300713-017000-6

Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
2144	Economy Boat Storage	4D	9.24	1	300159-007000-4
2229	Essman, Thomas	4B	3.62	1	300936-034000-2
1289	Fairchild, Lou	4C	1.00	1	300167-222040-2
1968	Fredeman, <i>et al.</i> , Steve	4A	11.00	2	300713-022000-9, 300192-008000-4
976	Gillespies Engine Service Inc	4A	12.00	2	300095-006000-1
1956	Ginn, Michael	4A	6.00	2	300713-010000-3
2209	Ginn, Mike	4B	29.56	1	300936-031500-4, 300936-031000-5, 300936-060000-9, 300936-058000-3, 300936-027000-1, 300936-061000-8
2207	Gramling, Robert	4B	13.17	1	300936-010000-0, 300936-009000-3
1960	Hale, Don	4A	6.00	2	300713-014000-9
2190	Henderson, Sam	4B	7.32	1	300936-056000-5
979	Henning, John	4A	10.00	2	300095-009000-8
2215	Hill, Thad	4B	6.77	1	300936-063000-6, 300936-064000-5
1970	Hodgson, David	4A	5.40	2	300713-024000-7
1959	Holliday, Joel	4A	6.00	2	300713-013000-0
2055	Houston Baptist, University	4A	38.00	2	300840-002000-4
2138	Houston Helicopters Inc	4C	20.00	1	300167-209000-3
1954	Jacks, John	4A	5.00	2	300713-008000-7
1804	Jefferson County	4B	55.75	1	300553-001000-4, 300553-006000-9, 300936-032000-4
1957	Keeney, Floyd	4A	6.00	2	300713-011000-2
2223	Kohn, Adolph	4B	13.00	1	300936-020000-8, 300936-021000-7
981	LeBlanc, Elaine	4A	7.00	2	300095-011000-4

Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
2126	Linder Oil Co	4C	18.41	1	300423-004000-7, 300167-197000-7
2204	Livingston, Sharon	4B	6.57	1	300936-039000-7
2193	Luzader, Richard	4B	2.64	1	300936-054000-7
1263	Margolis, Bonnie	4C	2.00	1	300167-054000-9, 300167-219000-1
2233	Martin, T.	4B	2.77	1	300936-051000-0
2214	MBW Enterprises	4A & 4B	125.20	1 & 2	300936-001000-1, 300713-033000-6, 300713-032000-7, 300713-031000-8, 300713-030000-9, 300192-023000-5, 300192-020000-8, 300192-019000-1, 300192-018000-2, 300192-017000-3, 300192-016000-4, 300192-015000-5, 300192-014000-6, 300095-033000-8, 300095-032000-9, 300095-031000-0, 300095-030000-1, 300095-029000-4, 300095-028000-5, 300095-027000-6, 300936-062000-7, 300095-019000-6, 300095-025000-8, 300095-026000-7, 300713-034000-5, 300713-035000-4, 300713-036000-3, 300713-037000-2
2206	McCarthy, Gerald	4B	3.44	1	300936-037000-9
2211	McCoy, James	4B	4.50	1	300936-059000-2
1267	McGaffey, I.T.	4C	12.00	1	300167-087000-0
1264	McGaffey, Thomas	4C	12.00	1	300167-084000-3

Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
1952	McKenna, Peggy	4A	5.00	2	300713-006000-9
2202	Messer, Shannon	4B	3.17	1	300936-041000-3
2197	Moreland, Charlene	4B	2.95	1	300936-046000-8
2146	Nguyen, <i>et al.</i> , Steve	4D	3.31	1	300159-009000-2, 300159-008000-3
2129	Norman Material Co	4C	48.49	1	300423-003000-8, 300167-212000-8
980	Palombo, Leonard	4A	6.00	2	300095-010000-5
1265	Parish Estate, Sammie	4C	12.00	1	300167-085000-2
2054	Parker, W.L.	4A	38.00	2	300840-001000-5
971	Pickard, William	4A	75.00	1 & 2	300095-001000-6, 300095-018000-7, 300095-008000-9, 300095-004000-3, 300095-005000-2
1962	Pitre, Marcus	4A	6.00	2	300713-016000-7
1953	Preston, Kyle	4A	9.00	2	300713-007000-8
1961	Rhodes, Malcolm	4A	6.00	2	300713-015000-8
2191	Rio Real Estate Ltd	4B	2.55	1	300936-019000-1
977	Ross, Harold	4A	6.00	2	300095-007000-0
2228	Rozewicz, Thomas	4B	3.71	1	300936-049000-5
2137	Sabine Offshore Services	4D	142.21	1	300067-010000-4, 300159-002000-9, 300159-003000-8
2192	Sabine Pass Land & Inv Co	4B	13.00	1	300936-022000-6, 300936-044000-0, 300936-040000-4
2139	Sabine Pilot Service Inc	4D	2.57	1	300159-011000-8
1276	Sartin, Linda	4C	5.00	1	300167-162000-8
1288	Scully, George	4C	3.00	1	300167-222030-3, 300167-222010-5
2201	Self, Harold	4B	3.13	1	300936-042000-2
2205	Shadoin, Ben	4B	6.75	1	300936-038000-8

Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
1969	Smith, James	4A	6.00	2	300713-023000-8
987	Smith, Michael	4A	6.00	2	300095-017000-8
2141	South Texas Land	4D	268.22	1	300159-004000-7, 300193-002000-8, 300164-003000-8, 300184-002000-7
990	Stanley, Grady Ray	4A	55.57	2	300095-020000-3, 300095-021000-2, 300095-022000-1, 300095-023000-0, 300095-024000-9, 300192-021000-7, 300192-022000-6, 300192-024000-4, 300713-038000-1, 300713-039000-0, 300713-040000-7
1004	Stone, Dale	4A	5.00	2	300095-034000-7
1418	Strickland, Helena	4A	11.00	2	300192-005000-7, 300713-004000-1
2188	Texas Ornithological Soc	4C	5.28	1	300167-094000-1
2124	Texas Sea Rim Pipeline	4C	10.67	1	300423-001000-0, 300246-001000-5
2194	Tyger, Vernon	4B	13.44	1	300936-017000-3, 300936-016000-4
2189	Unknown owner	4B	24.39	1	300936-018000-2
2218	Unknown owner	4B	6.48	1	300936-005000-7
2231	Unknown owner	4B	6.58	1	300936-008000-4
2183	US Fish & Wildlife	4C	706.29	1	300246-002000-4, 300167-210000-0
2232	Vidor, Karen	4B	2.82	1	300936-050000-1
1285	Vidrine, Joseph	4C	1.00	1	300167-220000-8
1426	Virva, Frank	4A	5.00	2	300192-013000-7, 300713-029000-2
2200	Waterbury, Carmen	4B	6.66	1	300936-013000-7

Texas Point NWR Expansion Proposal - Ownership List

TRACT	NAME	MAP #	DEEDED ACRES	PRIORITY	PARCEL TAX ID
973	Welch, James	4A	11.00	2	300095-003000-4, 300713-012000-1
1422	White, Carl	4A	16.00	2	300192-009000-3, 300713-003000-2, 300713-021000-0, 300713-025000-6
2230	Williams, Edward	4B	0.00	1	300935-035000-1
2152	Williams, Shelbia Jennings	4C	2.03	1	300167-035000-3
2155	Yates, Gladys	4C	4.00	1	300167-038000-0

APPENDIX I: SHPO SECTION 106 CONSULTATION



TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWRENCE OAKS, EXECUTIVE DIRECTOR

June 8, 2004

Tom Baca
Chief, Division of Planning
National Wildlife Refuge System
Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103

Re: Project review under Section 106 of the National Historic Preservation Act
USFWS/Texas Chenier Plain National Wildlife Refuge Complex Expansion
Proposed Management and Expansion Alternatives (USFWS)

Dear Mr. Baca,

Thank you for providing a description of the above proposed management and expansion alternatives for the Texas Chenier Plain complex. This letter serves as comment on the undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Ed Baker, has completed its review. The preferred alternative would aid in the acquisition and potential conservation of many cultural resources, including those identified in your prospectus by the Texas Archeological Research Laboratory. Any of the alternatives adding acreage to the federal refuge would likely add to the number and diversity of locations protected by federal cultural resources regulations. To our knowledge, none of the locations identified would necessitate further management effort simply by virtue of their acquisition by your agency.

Management actions other than land acquisition will require case-by-case review by our agency if the undertaking could affect known or previously unrecorded resources in the area of potential effect. Our two agencies currently consult on such undertakings under Section 106 of the National Historic Preservation Act and a Programmatic Agreement. We do not feel that reviewing undertakings described under the various alternatives would add significantly to the current review workload.

We hope your undertaking proceeds as planned, since it would appear to greatly enhance the potential to preserve our states cultural resources. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Ed Baker at 512/463-5866.**

Sincerely,

A handwritten signature in black ink, appearing to read "F. Lawrence Oaks".

for F. Lawrence Oaks, State Historic Preservation Officer
FLO/elb

APPENDIX J: INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Tim Cooper,
Project Leader, Texas Chenier Plain Refuge Complex
Telephone Number: (409)267-3337
Date: December 9, 2007

- I. Region:** 2
- II. Service Activity (Program):** National Wildlife Refuge System
- III. Pertinent Species and Habitat:**
- A. Listed species and/or their critical habitat within the action area: Brown Pelican (T), Piping Plover (T), Bald Eagle (T) occur within the Refuge Complex. Leatherback sea turtle (E), Hawksbill sea turtle (E), Kemp's Ridley sea turtle (E), Loggerhead sea turtle (T) and Green Sea Turtle (T) occur in offshore waters, but no nesting has been documented on the Refuge Complex.
 - B. Proposed species and/or proposed critical habitat within the action area: N/A
 - C. Candidate species within the action area: Mountain plover
 - D. Include species/habitat occurrence on a map: See attached Draft Texas Chenier Plain Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (Draft EIS/CCP/LPP).
- IV. Geographic area or station name and action:** Texas Chenier Plain Refuge Complex, including Anahuac National Wildlife Refuge (NWR) (Chambers and Galveston counties), Moody NWR (Chambers County), McFaddin NWR (Jefferson, Chambers, and Galveston counties) and Texas Point NWR (Jefferson County) Implementation of a Conservation Conservation Plan and Land Protection Plan for the Texas Chenier Plain Refuge Complex.
- V. Location (attach map);**
- A. Ecoregion Number and Name: Texas Gulf Coast
 - B. County and state: Chambers, Jefferson and Galveston Counties, Texas
 - C. Section, township, and range (or latitude and longitude): See Maps with the Draft EIS/CCP/LPP for location of the Refuge Complex.
 - D. Distance (miles) and direction to nearest town: Towns of Anahuac, High Island, and Sabine Pass are within the local geographic area.

E. **Species/habitat occurrence:**

Brown Pelicans regularly use shoreline habitats along the Gulf of Mexico, East Galveston Bay and the Gulf Intracoastal Waterway, adjacent bay and marine waters, and regularly fly over these areas on and adjacent to the refuges. Brown Pelicans occasionally roost and/or forage on the larger waterbodies within the Refuge Complex including Lake Surprise and Lake Wallis on Moody NWR, and Clam Lake on McFaddin NWR. No nesting colonies occur on the Refuge Complex. Piping Plovers use Gulf of Mexico and East Galveston Bay shoreline habitats on McFaddin, Texas Point and Anahuac NWR, and adjacent tidal mudflats during migration and winter (no nesting has been documented on the Refuge Complex). Bald eagles are occasionally present on the Refuge Complex, usually associated with large concentrations of waterfowl using wetland habitats during winter. Leatherback sea turtle, Hawksbill sea turtle, Kemp's Ridley sea turtle, Loggerhead sea turtle occur in offshore waters, but no nesting has been documented on the Refuge Complex.

VI. **Description of proposed action:** See attached Draft Texas Chenier Plain Refuge Complex EIS/CCP/LPP for and full description of the Refuge Complex Comprehensive Conservation Plan (Refuge Management Alternative D – Preferred Alternative) and Land Protection Plan (Refuge Boundary Expansion Alternative C – Preferred Alternative). The CCP will guide management of the Refuge Complex for a 15-year planning horizon. Proposed management activities include continuation of wetland and upland habitat management and restoration activities including water management, fire management, controlled grazing, exotic/invasive species control, cooperative rice farming (Anahuac NWR), and native coastal prairie and coastal woodlot restoration. Biological inventory, monitoring and research activities would be expanded, with an emphasis on declining or sensitive species. Increased efforts to address threats to biological integrity, biological diversity, and ecosystem health would include additional shoreline protection, beneficial use of dredge material, hydrological restoration, invasive species control, and contaminants monitoring. Public uses of the Refuge Complex would continue to include the priority wildlife-dependent uses of the NWRS: hunting, fishing, wildlife observation and photography, environmental education and interpretation. Under the Land Protection Plan, the approved refuge boundary would be expanded for each of the four refuges. A total of 64,260 acres would be included within the expanded approved boundaries. The expansion areas would include important coastal wetland and native coastal prairie habitats.

VII. **Determination of Effects:**

A. **Explanation of effects of the action on species and critical habitat in items III A, B, and C (attach additional pages as needed):**

No effect on Brown Pelican, Piping Plover, Bald Eagle. All three species are transients which do not nest on the Refuge Complex. No effect on Leatherback sea turtle, Hawksbill sea turtle, Kemp's Ridley sea turtle, Loggerhead sea turtle and Green sea turtle. All turtle species occur in offshore waters adjacent to the Refuge Complex, no nesting has been documented on the Refuge Complex. Mountain Plovers occur rarely on the Refuge Complex and are also transient.

B. **Explanation of actions to be implemented to reduce the adverse effects: N/A**

VIII. Effect determination and response requested: [*=optional]

A. Listed species/designated critical habitat:

<u>Determination</u>	<u>Response Requested</u>
No effect on species/critical habitat (species: Listed in Section III A above)	<u> X </u> *Concurrence
May effect, is not likely to adversely affect species/ critical habitat (species: _____)	_____ Concurrence
May affect, is likely to adversely affect species/ critical habitat (species: _____)	_____ Formal Consultation

B. Proposed species/proposed critical habitat:

<u>Determination</u>	<u>Response Requested</u>
No effect on proposed species/critical habitat (species: <u>None pending</u>)	<u> X </u> *Concurrence
Is not likely to jeopardize proposed species/ adversely modify proposed critical habitat (species: _____)	_____ Concurrence
Is likely to jeopardize propose species/ adversely modify proposed critical habitat (species: _____)	_____ Conference

C. Candidate species:

<u>Determination</u>	<u>Response Requested</u>
No effect on candidate species (species: Mountain Plover)	<u> X </u> *Concurrence
Is not likely to jeopardize candidate species (species: _____)	_____ Concurrence
Is likely to jeopardize candidate species (species: _____)	_____ Conference

Jim Logan 12-10-07
Signature Date
[Title/office of supervisor at originating office]

VIII. Reviewing ESFO Evaluations:

Note: The No Effect determination can be approved by the Supervisor of the Originating Office.

- A. Concurrence: _____ Nonconcurrency: _____
- B. Formal consultation required: _____
- C. Conference required: _____
- D. Informal conference required: _____
- E. Remarks (attach additional pages as needed):

Stephen D. Parry
Signature

12-11-07
Date

Clear Lake Ecological Services
Field Office