
**LACASSINE NATIONAL WILDLIFE REFUGE
DRAFT COMPREHENSIVE CONSERVATION PLAN
AND
ENVIRONMENTAL ASSESSMENT**

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Fish and Wildlife Service
Southeast Region

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TABLE OF CONTENTS

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. BACKGROUND	1
U.S. Fish and Wildlife Service	1
The National Wildlife Refuge System	1
National Wildlife Refuge System Improvement Act of 1997	1
Lacassine National Wildlife Refuge Comprehensive Conservation Plan	2
Purpose and Need for Plan	2
Legal Policy Context.....	3
Introduction	3
Coastal Zone Management Compliance.....	3
National Wildlife Refuge System Lands	3
Relationship to State Wildlife Agency	4
Ecosystem Context.....	4
Overview	4
Lower Mississippi River Ecosystem Priorities	6
Texas Gulf Coast Ecosystem Priorities.....	6
Ecological Threats and Problems	7
Conservation Priorities and Initiatives	7
Partners In Flight Bird Conservation Plan	8
North American Waterfowl Management Plan	8
Gulf Coast Joint Venture (Chenier Plain Initiative).....	8
North American Waterbird Conservation Plan	9
United States Shorebird Conservation Plan.....	9
Coastal Wetlands Planning, Protection, and Restoration Act	9
Coast 2050: Towards a Sustainable Coastal Louisiana.....	9
Louisiana Coastal Area Ecosystem Restoration Plan.....	10
Fisheries Vision for the Future	10
American Woodcock Management Plan	10
II. REFUGE DESCRIPTION	11
Introduction.....	11
Purpose	12
Priorities.....	12
Refuge Environment and Other Related Information	12
Fish, Wildlife, and Plant Populations.....	12
Habitats: (Includes Lacassine Pool).....	22
Education and Visitor Services	28
Refuge Administration.....	31
Coordination/Cooperative Programs.....	31
Facilities and Equipment.....	31
Research Natural Areas.....	32
Wilderness Review.....	32
Archaeological or Historical Resources	33
Land Protection and Conservation.....	34
Lacassine Pool.....	34
Socioeconomic Profile.....	36
Refuge Related Problems	37

Introduction	37
Undesirable or Invasive Species.....	37
Early Successional Wetlands (Moist-Soil Units)	38
Contamination.....	38
Oil and Gas Activities.....	38
Refuge Conservation Priorities.....	41
III. PLAN DEVELOPMENT	45
Overview	45
Scoping Meetings - General.....	45
Special Fishing focus group meeting	45
Special Lacassine Pool Management meeting	45
Special Hurricane damage meeting	46
Issues Identified by the Public During Scoping	47
Boats.....	47
Fishing	47
Tournaments.....	48
Hunting	48
Water management	49
Entrance/Use Fees	49
General	49
Issues Identified During Internal Scoping and the Biological and Public Use Reviews.....	49
Habitat	50
Wildlife	50
People.....	50
Cultural Resources	51
IV. MANAGEMENT DIRECTION.....	53
Introduction	53
Vision	53
Goals, Objectives, and Strategies	53
Goal A: Habitat Management	54
Goal B: Fish and Wildlife Management.....	65
Goal C: Oil and Gas Infrastructure and Activities	76
Goal D: Public Use Management.....	78
Goal E: Cultural Resources	84
Goal F: Refuge Complex Operations.....	85
V. PLAN IMPLEMENTATION.....	87
Introduction	87
Projects	87
Project 1 – Freshwater Impounded Marsh (Lacassine Pool).....	87
Project 2 – Early Successional Wetlands (Moist-Soil and Cooperative Farming Units) ...	89
Project 3 – Unimpounded Freshwater Marsh	91
Project 4 – Special Habitats: Wilderness, Prairie, and Bottomland Hardwoods	93
Project 5 – Undesirable Plant and Animal Control.....	94
Project 6 – Inventory and Monitor Wildlife Populations and Responses to Management Actions.....	94
Project 7– Improve Visitor Services	95

Project 8 – Promote and Enhance Priority Public Uses	97
Project 9 - Partnerships, Volunteers, Friends, and Interns	98
Funding and Personnel	99
Step-down management Plans	101
Partnership Opportunities.....	102
Monitoring and Adaptive Management.....	103
Plan Performance.....	103
VI. LIST OF PREPARERS.....	105
Planning Team	105
Contributors:.....	106
 SECTION B. ENVIRONMENTAL ASSESSMENT	
I. BACKGROUND	109
Introduction.....	109
Purpose and Need for Action	109
Decisions To Be Made	110
Planning Study Area.....	110
Comprehensive Conservation Planning Process and Issue Identification	111
II. ALTERNATIVES.....	113
Formulation of Alternatives.....	113
Description Of Alternatives	113
Alternative A – No Action (Current Management Direction).....	114
Alternative B – Proposed Action (Maximize refuge management capabilities in all programs).....	114
Alternative C — Secondary Action Alternative (maximize habitat quantity/quality for wintering waterfowl focusing on lacassine pool only).....	115
Comparison Of Alternatives.....	116
III. AFFECTED ENVIRONMENT	151
Reference	151
IV. ENVIRONMENTAL CONSEQUENCES	153
Overview.....	153
Effects Common To All Alternatives	153
Fish, Wildlife, and Habitat	153
Public Use	154
Cultural Resources.....	155
Oil and Gas Activity	155
Effects From Implementing Alternative A – “No Action” (Current Management).....	155
Fish, Wildlife, and Habitat	155
Public Use	156
Effects From Implementing Alternative B – The “Proposed Action”	157
Fish, Wildlife, and Habitat	157
Public Use	158
Effects From Implementing Alternative C – “Focus On Pool Management Only”.....	159
Fish, Wildlife, and Habitat	159

Public Use.....	160
SECTION C. APPENDICES	
APPENDIX A – GLOSSARY	163
APPENDIX B – REFERENCES AND LITERATURE CITATIONS	173
APPENDIX C – LEGAL MANDATES	177
APPENDIX D – BIOTA	185
APPENDIX E - SCOPING	195
Focus Group Meeting Report – September 4, 2003	201
Focus Group Meeting Report – September 4, 2003	202
Focus Group Meeting Report – September 4, 2003	203
Focus Group Meeting Results – May 8, 2005	206
APPENDIX F - COMPATIBILITY DETERMINATIONS.....	211
APPENDIX G - REFUGE OPERATING NEEDS AND SERVICE ASSET MAINTENANCE MANAGEMENT SYSTEM NEEDS	245

LIST OF FIGURES

Figure 1. U. S. Fish and Wildlife Service Region 4 Ecosystems.....	5
Figure 2. Location of Refuges within the Southwest Louisiana National Wildlife Refuge Complex.	13
Figure 3. Major features of Lacassine National Wildlife Refuge	14
Figure 4. Habitats of Lacassine National Wildlife Refuge	23
Figure 5. Management Units on Lacassine National Wildlife Refuge	24
Figure 6. Approved acquisition boundary of Lacassine National Wildlife Refuge	27
Figure 7. Current visitor facilities at Lacassine National Wildlife Refuge	29
Figure 8. This proposal was also chosen by the public in May 2005 as its proposed alternative for management of the Lacassine Pool	88
Figure 9. Current and proposed staffing for Lacassine National Wildlife Refuge, Southwest Louisiana National Wildlife Refuge Complex	100

LIST OF TABLES

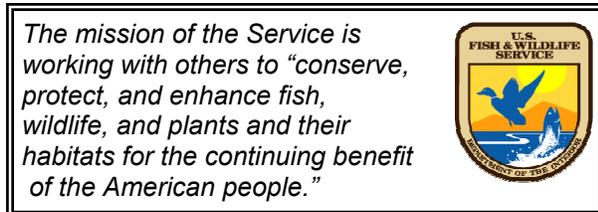
Table 1. Birds of management concern to Lacassine Refuge	17
Table 2. Recent Peak Numbers of Waterfowl on Lacassine Refuge	18
Table 3. Land cover/habitat types on Lacassine Refuge	22
Table 4. Equipment at Lacassine National Wildlife Refuge	32
Table 5. Occupations of employed civilian population 16 years and older in Cameron Parish (2000)	36
Table 6. Employment of civilian population 16 years and older by industry in Cameron Parish (2000)	37
Table 7. Estimated cost to improve Lacassine Pool	89
Table 8. Costs to expand and enhance early successional wetlands' management units	90
Table 9. Costs to expand and enhance cropland units at Lacassine National Wildlife Refuge	91
Table 10. Costs to improve and enhance unimpounded freshwater marsh.....	92
Table 11. Costs to improve special habitats, such as wilderness, prairie, and bottomland hardwoods	93
Table 12. Costs to control undesirable plants and animals	94
Table 13. Costs to inventory and monitor wildlife populations and responses to adaptive management techniques	95
Table 14. Costs to improve visitor services	96
Table 15. Costs to enhance priority public use	97
Table 16. Costs to enhance priority public use	98
Table 17. Cost of existing and proposed positions	99
Table 18. Summary of Costs for 2006 - 2021	101
Table 19. Step-down management plans	102
Table 20. Comparison of objectives by management alternative	117

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. Background

U.S. FISH AND WILDLIFE SERVICE

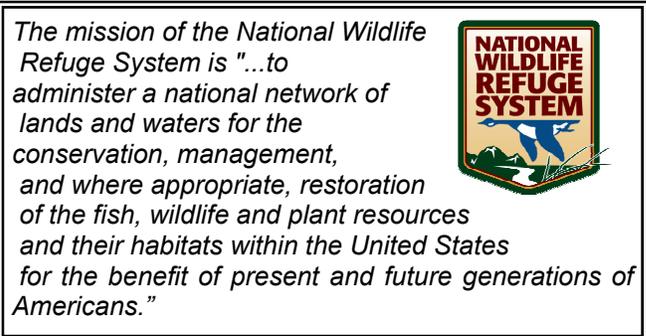
The U.S. Fish and Wildlife Service is the primary federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. Responsibilities are shared with other federal, state, tribal, and local entities; however, the Service has specific responsibilities for endangered species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters administered by the Service for the management and protection of these resources. It also operates national fish hatcheries, fishery resource offices, and



ecological services field stations. The Service enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat, such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid Program that distributes hundreds of millions of dollars from excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

THE NATIONAL WILDLIFE REFUGE SYSTEM

The Service manages the 95-million-acre National Wildlife Refuge System, which encompasses 545 national wildlife refuges, thousands of small wetlands, and other special management areas. The majority of these lands, 77 million acres, are in Alaska, with the remaining acres spread across the other 49 states and several territories. Approximately 82 million acres in the Refuge System were reserved from the public domain. The remainder was acquired through purchase, from other federal agencies, as gifts, or through easement and lease agreements.



NATIONAL WILDLIFE REFUGE SYSTEM IMPROVEMENT ACT OF 1997

An important milestone occurred in 1997 with the passage of the National Wildlife Refuge System Improvement Act, which has been called the “Organic Act” of the Refuge System. The Act established, for the first time, a clear legislative mission of wildlife conservation for the National Wildlife Refuge System.

The Act also recognized the outstanding recreational opportunities on refuges. The Refuge System has long provided some of the nation's best hunting and fishing, and our refuges continue to support these deeply rooted American traditions. The law established compatible wildlife-dependent recreation, such as hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation as priority public uses of the Refuge System.

Among other things, this far-reaching law required comprehensive conservation planning for each refuge, and set standards to assure that all uses of refuges were compatible with their purposes and the Refuge System's wildlife conservation mission. It also required the Service to conserve the biological integrity, diversity, and environmental health of refuges, and consider the conservation of the ecosystems of the United States in planning the growth of the Refuge System.

The Service's planning process is premised on strong partnerships with state fish and wildlife agencies. It provides an opportunity to use science in managing refuges, assuring an ecological perspective as to how refuges fit into the greater surrounding landscapes. The planning process also provides citizens with a meaningful role in helping to shape future management of individual refuges and recognizes the important roles they play in the lives of nearby communities.

The Act states that each refuge shall be managed to:

- Fulfill the mission of the National Wildlife Refuge System;
- Fulfill the individual purpose of each refuge;
- Consider the needs of wildlife first;
- Fulfill requirements of comprehensive conservation plans that are prepared for each unit of the Refuge System;
- Maintain the biological integrity, diversity, and environmental health of the Refuge System;
- Recognize that wildlife-dependent recreation activities including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, are legitimate and priority public uses; and
- Allow refuge managers authority to determine compatible public uses.

LACASSINE NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN

This Draft Comprehensive Conservation Plan for Lacassine National Wildlife Refuge, the 123rd refuge in the National Wildlife Refuge System, is being prepared as mandated by the Act to guide management actions and direction for the refuge for the next 15 years. Fish and wildlife conservation will receive first priority in refuge management; wildlife-dependent recreation will be allowed and encouraged as long as it is compatible with, and does not detract from, the mission of the refuge or the purposes for which it was established.

The mission of Lacassine National Wildlife Refuge is to protect, restore, enhance, and manage a representative portion of freshwater wetland and associated habitats for the benefit of wintering waterfowl, other migratory birds, threatened and endangered species, and people.

PURPOSE AND NEED FOR PLAN

The purpose of the comprehensive conservation plan is to ensure that each refuge contributes to the Refuge System's mission to provide a 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.

Specifically, the plan is needed to:

- Provide a clear statement of refuge management direction;
- Provide refuge neighbors, visitors, and government officials with an understanding of Service management actions on and around the refuge;
- Ensure that Service management actions, including land protection and recreation and education programs, are consistent with the mandates of the National Wildlife Refuge System;
- Ensure that refuge management is consistent with the purpose for which the refuge was established;
- Ensure that refuge management is consistent with federal, state, and local plans and contributes to the mission of the ecosystem in which it is located; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

LEGAL POLICY CONTEXT

INTRODUCTION

The mission and goals of the National Wildlife Refuge System, congressional legislation, Presidential executive orders, and international treaties guide administration of national wildlife refuges. Policies for management options of refuges are further refined by administrative guidelines established by the Secretary of the Interior and by policy guidelines established by the Director of the Fish and Wildlife Service. Refer to Appendix C for a complete listing of relevant legal mandates.

COASTAL ZONE MANAGEMENT COMPLIANCE

The Service also complies with all federal, state, and regional policies and regulations for projects within the boundaries of national wildlife refuges. The Louisiana Department of Natural Resources requires Coastal Zone Permits for work that may affect the land use, water use, or natural resources of the Coastal Zone. The Coastal Zone boundary is the northern bank of the Gulf Intracoastal Waterway. Although the Service is exempt from Coastal Zone Permits, it is required to be consistent with the Coastal Zone Management Program requirements for work within its boundary that may affect resources south of the boundary, regardless of where the project occurs. A No Effect Determination to the Coastal Zone area is applicable for projects described in this plan that will be completed within the refuge boundary.

NATIONAL WILDLIFE REFUGE SYSTEM LANDS

Lands within the National Wildlife Refuge System are closed to public use unless specifically and legally opened. All programs and uses must be evaluated based on mandates set forth in the National Wildlife Refuge System Improvement Act. Those mandates are to:

-
- Contribute to ecosystem goals, as well as refuge purposes and goals;
 - Conserve, manage, and restore fish, wildlife, and plant resources and their habitats;
 - Monitor the trends of fish, wildlife, and plants;
 - Manage and ensure appropriate visitor uses (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and
 - Ensure that visitor activities are compatible with refuge purposes.

RELATIONSHIP TO STATE WILDLIFE AGENCY

A provision of the Act, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with other federal agencies and state fish and wildlife agencies during the course of acquiring and managing refuges. State wildlife management areas and national wildlife refuges provide the foundation for protection of species, and contribute to the overall health and diversity of fish and wildlife species in the State of Louisiana.

The Louisiana Department of Wildlife and Fisheries is a state-partnering agency with the Service, charged with enforcement responsibilities relating to migratory birds and endangered species, as well as managing state natural resources and approximately 1.4 million acres of coastal marshes and wildlife management areas. The Department coordinates the wildlife conservation program and provides public recreation opportunities on Louisiana wildlife management areas. The state's participation and contribution throughout this planning process provides for ongoing opportunities and open dialogue to improve the ecological health and diversity of fish and wildlife. A vital part of the planning process is integrating common mission objectives, where appropriate.

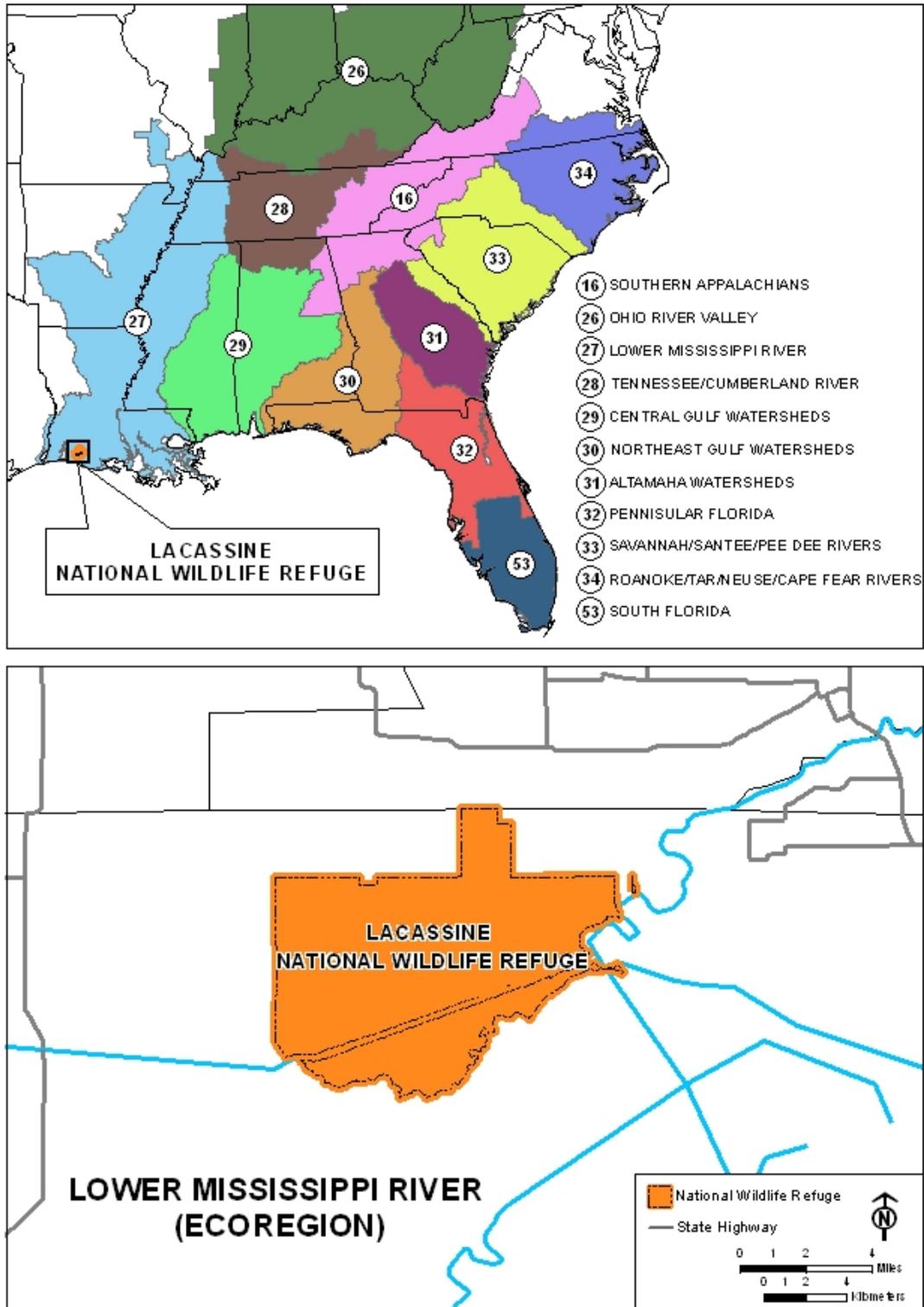
ECOSYSTEM CONTEXT

OVERVIEW

The Service is increasing its efforts to adopt collaborative resource partnerships with private landowners and local communities, as well as state and federal governments within ecosystems. The purpose is to reduce the declining trend of fish and wildlife populations and biological diversity, to establish conservation priorities, to clarify goals, and to solve common threats and problems associated with fish and wildlife resources. The synergy of all federal, state, tribal, and private organizations, working together, will ensure that the Service not only protects the more important areas, but also reduces redundancy and overlap.

Lacassine Refuge is a member and active participant of the Service's Lower Mississippi River Ecosystem Team (Figure 1). The Lower Mississippi River Ecosystem is the primary wintering habitat for mid-continent waterfowl populations, as well as breeding and migration habitat for songbirds returning from Central and South America, and provides high-quality habitat for resident wildlife species.

Figure 1. U. S. Fish and Wildlife Service Region 4 Ecosystems



Geographically, the refuge lies on the extreme southwestern boundary of the Lower Mississippi River Ecosystem and has few opportunities to contribute to many of its goals and objectives. There are some common targets applicable to the refuge and to which it contributes, but the refuge would more appropriately contribute to the goals and objectives of the Service's Texas Gulf Coast Ecosystem. The Texas Gulf Ecosystem lies between the Sabine River and the mouth of the Rio Grande River and inland to include the historical coastal prairie. It is considered by many to be part of a larger ecological Gulf Coast system that also includes portions of coastal Louisiana and Mexico. The Texas Gulf Coast Ecosystem team has requested that Region 4 refuges in nearby Louisiana participate in its team meetings.

LOWER MISSISSIPPI RIVER ECOSYSTEM PRIORITIES

Priorities identified by the Lower Mississippi River Ecosystem to which the refuge can contribute include:

- Continue to work with the Louisiana Coastal Wetlands Task Force, private landowners, and other entities to protect and restore coastal wetlands, consistent with the Coast 2050 Plan and associated project planning, evaluation and implementation activities;
- Consider all grant opportunities available to the Lower Mississippi River Ecosystem Team and partners and work to improve internal coordination of these programs to assure that the contributions to these programs are of maximum benefit to the resource;
- Support environmental education efforts underway by Service offices to enhance and expand knowledge, awareness, and appreciation of trust resources;
- Restore native prairie;
- Control invasive and exotic species; and
- Build regional and national support for the Service's Fisheries Program.

TEXAS GULF COAST ECOSYSTEM PRIORITIES

Priorities identified by the Texas Gulf Coast Ecosystem to which the refuge can contribute include:

- Restore, conserve, enhance, and maintain approximately 500,000 acres of the historic Gulf Coast prairies in Louisiana, Texas, and Mexico to ensure the continued existence of native flora and fauna;
- Maintain, restore, enhance, and create wetlands and associated habitats to achieve a net gain in wetland quality, quantity (based on National Wetland Inventory data), and natural productivity;
- Increase ecological monitoring and research efforts and improve information management capabilities in the Texas Gulf Coast Ecosystem;
- Encourage Region 4 field stations with similar coastal resource objectives to participate in its team meetings; and

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- Develop partnerships with other Service Regions, Mexico, natural resource agencies, universities, and non-governmental organizations to plan and implement outreach programs.

ECOLOGICAL THREATS AND PROBLEMS

National wildlife refuges in the Lower Mississippi Valley serve as part of the last safety net to support biological diversity—the greatest challenge facing the Service. According to the Lower Mississippi River Ecosystem Team, the greatest threats to biological diversity within the Lower Mississippi Valley include:

- The loss of sustainable communities, including the loss of 20 million acres of bottomland hardwood forests;
- The loss of connectivity between bottomland hardwood forest sites (e.g., forest fragmentation);
- The effects of agricultural and timber harvesting practices;
- The simplification of the remaining wildlife habitats within the ecosystem and gene pools;
- The effects of constructing navigation and water diversion projects; and
- The cumulative habitat effects of land and water resource development activities.

Specific threats applicable to Lacassine National Wildlife Refuge include:

- Gradual filling in of Lacassine Pool with sediments and accumulated organic material (e.g., dead plant matter) leading to loss of water volume, open water surface area, and excessively dense and extensive emergent vegetation;
- Colonization of invasive plant and animal species, which displace natural vegetation and degrade those habitats on which native animal species depend; and
- Problems associated with the Gulf Intracoastal Waterway and Bayou Lacassine (Willow Cutoff), including soil and marsh erosion caused by wave action and contamination resulting from barge accidents.

CONSERVATION PRIORITIES AND INITIATIVES

Conservation priorities for national wildlife refuges in the Lower Mississippi Valley focus on threatened and endangered species, trust species, and species of local concern. Goals and objectives in this comprehensive conservation plan are stepped down from the following plans:

- Partners in Flight Bird Conservation Plan;
- North American Waterfowl Management Plan (e.g., Gulf Coast Joint Venture, Chenier Plain Initiative);
- North American Waterbird Conservation Plan;
- United States Shorebird Conservation Plan;
- Coastal Wetlands Planning Protection and Restoration Act;
- Coast 2050 – Towards a Sustainable Coastal Louisiana;

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- Louisiana Coastal Area Ecosystem Restoration Plan;
 - Fisheries Vision for the Future; and
 - American Woodcock Management Plan.

PARTNERS IN FLIGHT BIRD CONSERVATION PLAN

The National Fish and Wildlife Foundation led efforts in the 1990s to form the Partners in Flight program to combine resources and knowledge of many people to jointly protect the natural diversity of our continent. Many partners have made the program successful by participating in Working Groups to develop Regional Bird Conservation Plans. Lacassine Refuge is located within the Coastal Prairie Physiographic Area 6 and can contribute to the plan's actions for marsh restoration projects to benefit migratory landbirds.

NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

The North American Waterfowl Management Plan was signed by the United States and Canadian governments in 1986, and undertook an intensive effort to protect and restore North America's waterfowl populations and their habitats. With its update in 1994, Mexico became a signatory to the plan. Restoration of wetlands and associated ecosystems is the main premise of the plan in order to restore waterfowl populations to levels observed in the 1970s.

GULF COAST JOINT VENTURE (CHENIER PLAIN INITIATIVE)

Regional partnerships or joint ventures composed of individuals, sportsmen's groups, conservation organizations, and local, state, provincial, and federal governments were formed under the North American Waterfowl management Plan. One such partnership—the Gulf Coast Joint Venture—formed to conserve priority waterfowl habitat range along the western United States Gulf Coast, one of the most important waterfowl areas in North America. The Gulf Coast is the terminus of the Central and Mississippi Flyways, which provides both wintering and migration habitat for significant numbers of the continental goose and duck populations. The Gulf Coast Joint Venture's greatest contribution to the North American Waterfowl Management Plan is to provide wintering grounds for waterfowl. A great diversity of birds, mammals, fish, shellfish, reptiles, and amphibians also rely on the wetlands of the Gulf Coast for part of their life cycles.

The Gulf Coast Joint Venture is divided geographically into six initiative areas, one of which is the Chenier Plain Initiative area of southwest Louisiana and southeast Texas. 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 geese (*Chen caerulescens*), and greater white-fronted geese (*Anser albifrons*), as well as year-round habitat for mottled ducks (*Anas fulvigula*).

The refuge contributes to the objectives of this Initiative by its management of impounded freshwater marsh (e.g., Lacassine Pool), increasing moist-soil management capabilities on up to 1,000 acres of early successional wetlands (e.g., moist-soil units), providing resting and breeding habitat for mottled ducks, banding mottled ducks in cooperation with the Louisiana Department of Wildlife and Fisheries, furnishing nest boxes for wood ducks (*Aix sponsa*) and black-bellied whistling ducks (*Dendrocygna autumnalis*), and providing approximately 550 acres of croplands as food for wintering waterfowl.

NORTH AMERICAN WATERBIRD CONSERVATION PLAN

The North American Waterbird Conservation Plan was developed under a partnership, the Waterbird Conservation for the Americas, which is a group of individuals and organizations having interest and responsibility for conservation of waterbirds and their habitats in the Americas. Lacassine Refuge is located in the Southeast U.S. Regional Waterbird Conservation Planning Area. The refuge can contribute to a key objective of this region, which is to standardize data collection efforts and analysis procedures to allow better tracking of regional movements and the association of these movements with environmental or land use changes.

UNITED STATES SHOREBIRD CONSERVATION PLAN

The United States Shorebird Conservation Plan is a partnership involving organizations throughout the United States committed to the conservation of shorebirds. Lacassine Refuge is located within the Lower Mississippi, Western Gulf Coast Shorebird Planning Region. On a regional scale, the refuge can help ensure that adequate quality and quantity of habitat are identified and maintained to support the different shorebirds that breed in, winter in, and migrate through the area.

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

In 1990, Congress passed the Coastal Wetlands Planning, Protection, and Restoration Act that generates \$50 to \$60 million annually for Louisiana coastal wetland restoration projects via an 85/15 federal/state cost-share, and which provided for the development of the 1993 comprehensive Louisiana Coastal Wetlands Restoration Plan. Funding of proposed projects is determined by the Louisiana Coastal Wetlands Conservation and Restoration Task Force, which is composed of five federal agencies and the State of Louisiana. As mandated by the Coastal Wetlands Planning, Protection, and Restoration Act, the task force developed a detailed Coastal Wetlands Restoration Plan in 1993, that describes what restoration actions and projects should be implemented to address Louisiana's coastal land-loss crisis. A Priority Project List is developed and approved by the task force each year, outlining which projects will receive funding.

COAST 2050: TOWARDS A SUSTAINABLE COASTAL LOUISIANA

Coast 2050, funded by the Coastal Wetlands Planning, Protection, and Restoration Act, is a comprehensive, ecosystem-based plan developed to address coastal wetland loss throughout southern Louisiana by private citizens, local, state, and federal agencies, and the scientific community. This plan, which is recognized by the State of Louisiana, five federal agencies, and local coastal parish governments, serves as the joint coastal restoration plan for the Coastal Wetlands Planning, Protection, and Restoration Act. The overarching goal of the plan is to sustain a coastal ecosystem that supports and protects the environment, economy, and culture of southern Louisiana, and that contributes greatly to the economy and well-being of the nation. Coast 2050 strategic objectives include: 1) to sustain a coastal ecosystem with the essential functions and values of the natural ecosystem; 2) to restore the ecosystem to the highest practicable acreage of productive and diverse wetlands; and 3) to accomplish this restoration through an integrated program that has multiple use benefits (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). Lacassine Refuge is included in Region 4 of this plan.

LOUISIANA COASTAL AREA ECOSYSTEM RESTORATION PLAN

The Louisiana Coastal Area Ecosystem Restoration Plan evolved from the Coast 2050 Plan, with the overarching goal of reversing the current trend of degradation of the coastal ecosystem. This plan formed the basis for the Louisiana Coastal Area Ecosystem Restoration Study, designed to identify critical ecological needs, identify restoration efforts, establish restoration priorities, and identify scientific uncertainties to present a strategy for addressing long-term needs of coastal Louisiana restoration.

Lacassine Refuge is located within Sub-province 4 of the Louisiana Coastal Area. The restoration plans identified in the Louisiana Coastal Area relate directly and indirectly to the refuge through long-term efforts to explore large-scale restoration projects that will influence the entire coastal zone of Louisiana.

FISHERIES VISION FOR THE FUTURE

In 2001, the Fish and Wildlife Service worked with partners to refocus its Fisheries Program and develop a vision. This vision of the Service and its Fisheries Program *“is working with partners to restore and maintain fish and other aquatic resources at self-sustaining levels and to support Federal mitigation programs for the benefit of the American public.”* To achieve the vision, the Fisheries Program works with its partners to:

- Protect the health of aquatic habitats;
- Restore fish and other aquatic resources; and
- Provide opportunities to enjoy the benefits of healthy aquatic resources.

Together, the group developed a series of goals, objectives, and implementation actions to focus on key needs. Lacassine Refuge can contribute to the program’s recreational fishing goal to provide quality opportunities for responsible fishing and other related recreational enjoyment of aquatic resources on Service lands.

AMERICAN WOODCOCK MANAGEMENT PLAN

Developed by the Fish and Wildlife Service in 1990, the American Woodcock Management Plan sets management goals to restore woodcock population to levels consistent with the demands of consumptive and non-consumptive users (U.S. Fish and Wildlife Service 1990). Reliable annual population estimates, harvest estimates, and information on recruitment and distribution are essential for comprehensive woodcock management, as well as conserving and managing habitat.

II. Refuge Description

INTRODUCTION

Created in 1937, Lacassine National Wildlife Refuge was the 123rd refuge established within the National Wildlife Refuge System. It is located at the edge of Grand Lake and 15 miles from the Gulf of Mexico in Cameron and Evangeline Parishes in Louisiana (Figure 2). The refuge is strategically located on the boundary of coastal marsh and agricultural habitats as well as at the southern terminus of the Mississippi and Central Flyways, making the refuge critically important to migratory birds, especially wintering waterfowl.

Most of the 34,724-acre refuge consists of freshwater marsh with only a few natural ridges and levees (Figure 3). The dominant feature of the refuge is Lacassine Pool, created by enclosing a 16,000-acre marsh with a low levee. The refuge is bisected from east to west by the Gulf Intracoastal Waterway and north to south by Lacassine Bayou. Habitat types and approximate acreage on the Refuge include: 14,700 acres of fresh marsh; 16,000 acres of impounded fresh marsh; 1,048 acres of open water; 352 acres of forested wetlands; 348 acres of shrub wetlands; 1,109 acres of croplands (e.g., rice and fallow), 307 acres of managed fresh marsh (e.g., moist-soil plant impoundments); and 334 acres of coastal prairie plus roads, levees, etc. About 3,300 acres south of the Gulf Intracoastal Waterway are set aside with wilderness designation. The vegetative types occurring on the refuge are primarily water-tolerant grasses, sedges, and shrubs. The types vary according to the frequency, depth, and length of time water covers the area. Vegetation in the unmanaged marshes is predominantly bulltongue (*Sagittaria lancifolia*). Vegetation in Lacassine Pool consists primarily of bulltongue, maidencane (*Panicum hemitomon*), watershield (*Brasenia schreberi*), waterlily (*Nymphaea sp.*), spikerush (*Eleocharis sp.*), and southern bulrush (*Scirpus sp.*).

Lacassine Refuge provides valuable habitat for resident and migratory birds (e.g., ducks, geese, shorebirds, neotropical migratory birds, and wading birds), mammals (e.g., rabbits, armadillos, bobcats, coyotes, foxes, and raccoons), rodents, reptiles (e.g., snakes, turtles, lizards, and alligators) and other wildlife. Lacassine Pool serves as a sanctuary for wintering waterfowl with a large concentration of birds using the area to feed or rest. Large wintering concentrations of white-fronted and snow geese can be found here, along with predominately puddle ducks, such as pintails, blue and green-winged teals, mallards, gadwalls, shovelers, and American widgeons. Smaller concentrations of diving ducks, and Canada and Ross' geese also utilize the refuge.

Refuge habitat is managed for use by all native wildlife, with special emphasis on waterfowl. Because of this management emphasis, an outstanding recreational fisheries resource was developed. Management techniques used at Lacassine Refuge include prescribed burning, managing for early successional wetland and emergent aquatic wetland plants, planting food crops (e.g., predominately rice) and water level manipulation. Approximately 2,129 acres are managed for early successional wetland (e.g., moist-soil) plants and agricultural crops to provide desirable waterfowl food. The refuge also uses several management techniques to provide suitable conditions for waterfowl within Lacassine Pool.

PURPOSE

Lacassine National Wildlife Refuge was established on December 30, 1937, as Lacassine Migratory Waterfowl Refuge by the following: 1) Executive Order 7780, "...as a Refuge and breeding ground for migratory birds and other wildlife...;" 2) the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or any other management purpose, for migratory birds," (USC 715d). Additional lands were added to the refuge under 3) Fish and Wildlife Act of 1956 "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 USC 742f(a)(4)] and 4) "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services" [16 USC 742f(b)(1)].

PRIORITIES

Lacassine Refuge aims to conserve and restore desirable habitat and, in Lacassine Pool, to maintain a desirable water depth and open water ratio considered valuable for fulfilling the purpose for which the refuge was established.

Priorities of the refuge are to:

- Develop and manage the refuge for migratory birds, with special emphasis on waterfowl (especially northern pintail and mottled ducks).
- Develop and manage the refuge for native flora and fauna common to the marshes in Louisiana and rare and endangered species/habitat types;
- Provide opportunities for research by serving as a demonstration area and outdoor laboratory for those studying the ecology of southwest Louisiana wetlands; and
- Encourage wildlife-dependent recreation (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental educational and interpretation) on the refuge compatible with the refuge's mission and goals.

REFUGE ENVIRONMENT AND OTHER RELATED INFORMATION

FISH, WILDLIFE, AND PLANT POPULATIONS

Although established to provide wintering habitat for waterfowl, Lacassine Refuge supports many communities of terrestrial and aquatic wildlife. The refuge actually lies at the interface of higher agricultural land and the coastal marshes and includes considerable acreage of marsh and agriculture within its boundaries. It has a high plant and animal species diversity due to its different elevations and water depths, although in this flat part of the country, these elevation differences are measured in inches and feet rather than hundreds or thousands of feet. Wildlife species on the refuge are those indigenous to the marshes of coastal Louisiana. Several nesting colonies of wading and water birds, such as ibises, roseate spoonbills (*Ajaia ajaja*), and egrets are found here. A large population of alligators and furbearers, such as nutria (*Myocastor coypos*) and raccoon, are on the refuge. Several hundred thousand ducks and geese historically utilize the refuge as wintering habitat, while wood ducks (*Aix sponsa*), mottled ducks (*Anas fulvigula*), and fulvous (*Dendrocygna bicolor*) and black-bellied (*Dendrocygna autumnalis*) whistling ducks nest here during the breeding season.

Figure 2. Location of Refuges within the Southwest Louisiana National Wildlife Refuge Complex.

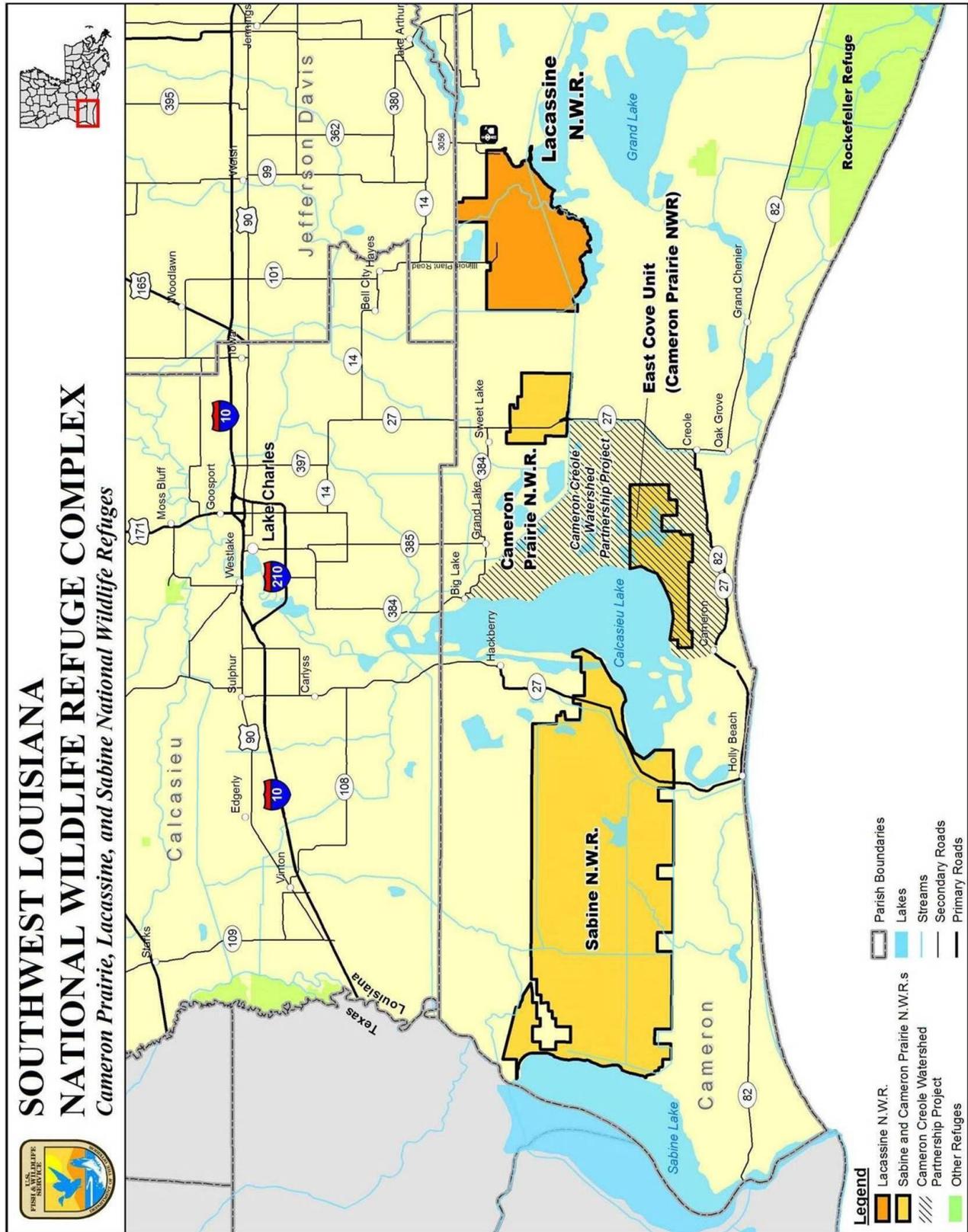
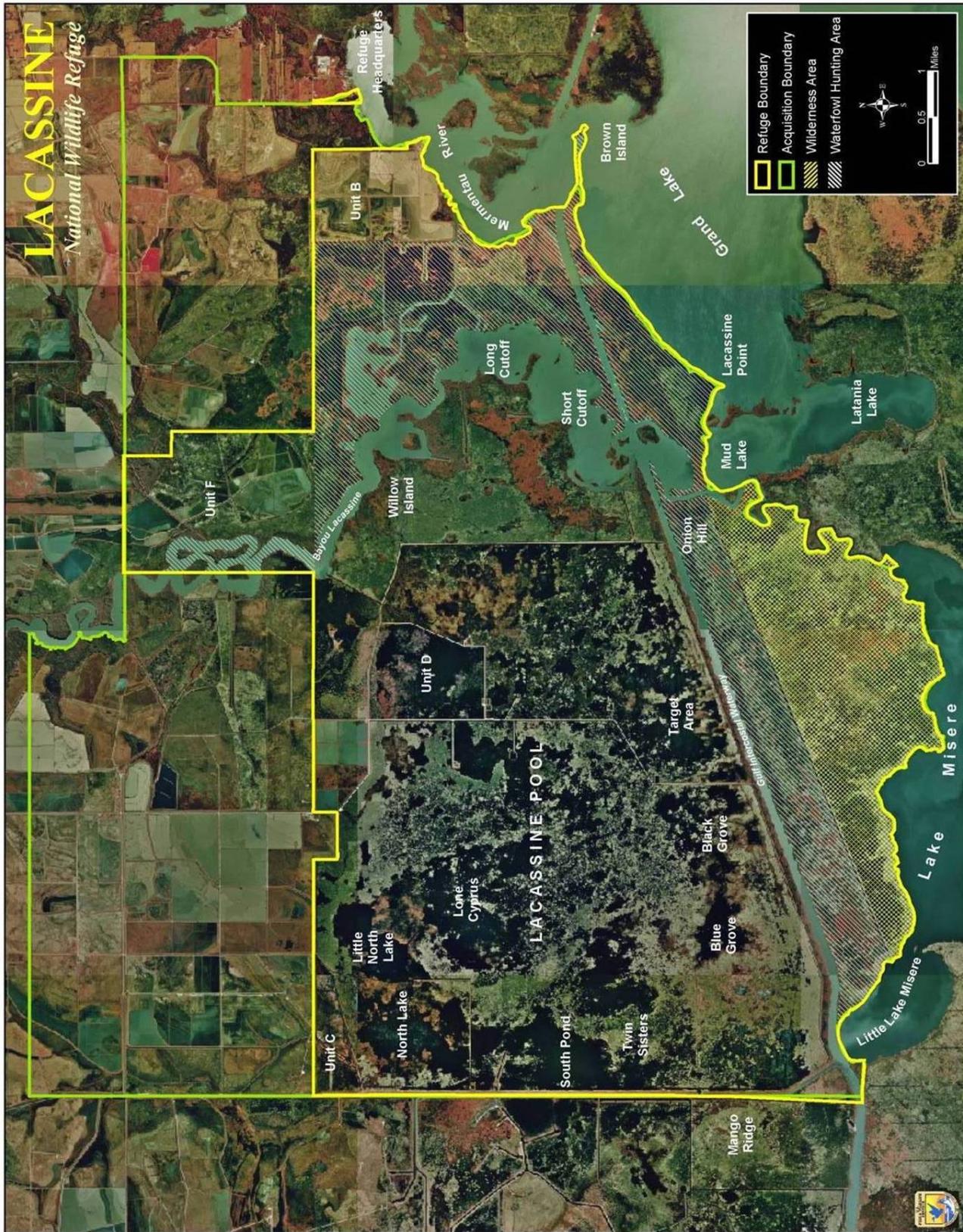


Figure 3. Major features of Lacassine National Wildlife Refuge



Threatened and Endangered Species

One federally listed threatened species occurs on the refuge – the bald eagle (*Haliaeetus leucocephalus*). The refuge may also attract transient Louisiana black bears, also a federally listed threatened species.

The bald eagle was first listed on March 11, 1967, and several recovery plans have been written to recover the species. It is currently designated as threatened in its current range of the conterminous United States and Alaska. Although the bald eagle was recommended for delisting in 1999, it was determined additional data would be needed before taking this action. Current threats are loss of nesting habitat due to development along the coast and near inland rivers and waterways. Bald eagles have been seen on Lacassine Refuge and it has habitat that could contribute to the well-being of this species.

The Louisiana black bear was first listed on January 7, 1992. It is currently designated as threatened in its entire range of Louisiana, Mississippi, and Texas. Lacassine Refuge is outside of known occupied habitat (i.e., defined as an area with resident reproducing female Louisiana black bear), however, it may receive rare use by transient animals. Male Louisiana black bears can travel far from occupied habitats and have been documented in every parish in Louisiana at least once. Lacassine Refuge does not provide habitat typically used by bears, but such long-ranging individuals may pass through and use the area.

Species of Fish and Wildlife Service Management Concern

The paddlefish (*Polyodon spathula*) is a Fish and Wildlife Service, Region 4, species of management concern. Louisiana Department of Wildlife and Fisheries personnel have identified Lacassine Bayou and the Mermentau River as extremely important areas for paddlefish. Paddlefish populations have declined throughout much of their historic range in North America due to habitat changes and over-fishing, mostly to supply the caviar market. Due to their scarcity, and to threats posed from over-harvest, no harvest of paddlefish is currently allowed in Louisiana. Despite prohibitions on harvest, some incidental take of paddlefish in nets and with other tackle sometimes occurs. The refuge prohibits commercial fishing in the portions of the streams that are within its boundaries and jurisdiction.

A 1988 amendment (Public Law 100-653, Title VIII) to the Fish and Wildlife Conservation Act of 1980 mandated the Service to “ identify species, subspecies, and populations of all migratory non-game birds, that without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.” *Birds of Conservation Concern 2002* is the most recent effort to carry out this mandate (USFWS 2002a). The report strives to accurately identify migratory and non-migratory bird species, beyond those already designated as federally threatened or endangered, that represent the Service’s highest conservation priorities in order to draw attention to species in need of conservation action. *Birds of Conservation Concern 2002* lists birds of conservation concern at three geographic scales – North American Bird Conservation Initiative Bird Conservation Regions, Fish and Wildlife Service regions, and national – to maximize the utility of the lists for partners, agencies, and organizations.

Three national plans were used to place birds on the lists: Partners In Flight, U.S. Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. Current conservation assessment scores for each species were taken from the three plans, which were based on several factors, including population trends, threats, distribution, abundance, and area importance.

While all the bird species included in *Birds of Conservation Concern 2002* are priorities for conservation action, the lists make no findings with regard to whether they warrant consideration for Endangered Species Act listing. The Service's goal is to prevent or remove the need for additional listings by implementing proactive management and conservation actions.

There have been 236 bird species recorded at Lacassine Refuge (USFWS 2002b, 1989a). The refuge's bird checklist is presented in Appendix D.

Table 1 lists birds known or expected to occur on Lacassine Refuge that are of management concern. Refer to Appendix D for scientific names.

Species of Refuge Management Concern

The northern pintail has become a species of special concern to the refuge as populations have steadily decreased over the years. The refuge hosted numbers well over 100,000 until the mid-1980s, then saw peaks reduced by half in the 1990s. Northern pintails, however, are one of the few ducks that continue to lag far behind their North American Waterfowl Management Plan population objective. Southwest Louisiana is one of the key wintering areas for pintails, and the open, shallow water habitats of flooded and managed rice fields are ideal for the species. Specifically targeting pintails as a species of refuge management concern is therefore appropriate.

Alligator snapping turtles (*Macrolemmys temminckii*), one of the world largest freshwater turtles, are becoming increasingly rare throughout their range. Commercial harvest is allowed in Louisiana, despite being outlawed in all other states. These turtles are known to occur in Lacassine Bayou and are occasionally taken on trotlines. Although there is currently no federal or state protection, such protection may be needed, since these long-lived creatures do not reach sexual maturity for many years. They are vulnerable to over-harvest from which populations may take a long time to recover.

Waterfowl

Historically supporting over 500,000 ducks and 150,000 geese at peak population, the refuge serves as one of the major wintering grounds for waterfowl in the Mississippi Flyway and serves as host to large concentrations of northern pintails and greater white-fronted geese, two species of particular concern in the Mississippi Flyway. Other common wintering species include blue-winged and green-winged teal, gadwall, American widgeon, northern shoveler, mallard, ring-necked duck (*Aythya collaris*), and snow geese. Table 2 shows peak waterfowl numbers at Lacassine Refuge for three recent years.

Lacassine Refuge is in the heart of rice farming country, which supports large numbers of geese. The refuge's largest concentration of white-fronted, snow, Ross, and Canada geese are found on its farm units. Small numbers of white-fronted and Canada geese use the Lacassine Pool. The refuge provides nesting habitat for wood and mottled ducks, black-bellied and fulvous whistling-ducks, and blue-winged teal.

Table 1. Birds of management concern to Lacassine Refuge

Common Name	Bird Conservation Region 37 List	USFWS Region 4 List	National List
American Bittern	X		
Little Blue Heron		X	X
Reddish Egret	X	X	X
White Ibis	X		
Northern Harrier	X		X
Peregrine Falcon	X	X	X
Yellow Rail	X	X	X
American Golden-Plover	X		X
Upland Sandpiper			X
Whimbrel	X	X	X
Long-billed Curlew	X	X	X
Marbled Godwit	X	X	X
Red Knot	X	X	X
Stilt Sandpiper	X		X
Short-billed Dowitcher	X		X
Gull-billed Tern	X	X	X
Common Tern			X
Least Tern	X	X	X
Black Tern	X		
Black Skimmer	X	X	X
Black-billed Cuckoo			X
Burrowing Owl		X	X
Short-eared Owl	X	X	X
Chuck-will's Widow		X	X
Whip-poor-will			X
Red-headed Woodpecker	X	X	X
Scissor-tailed Flycatcher			X
Sedge Wren	X		X
Wood Thrush			X
Golden-winged Warbler		X	X
Prairie Warbler		X	X
Cerulean Warbler		X	X
Prothonotary Warbler	X	X	
Worm-eating Warbler		X	X
Louisiana Waterthrush			X
Kentucky Warbler	X		X
Canada Warbler			X
LeConte's Sparrow	X	X	X
Saltmarsh Sharp-tailed Sparrow			X

Wading Birds (Water and Marsh Birds)

Lacassine Refuge provides nesting and feeding areas for large numbers of wading and marsh birds. Historically, Black Grove and Blue Grove, located in the southern portion of the pool, and Unit C have been the main rookery sites and some are still used. Smaller rookeries in cypress (*Taxodium distichum*), buttonbush (*Cephalanthus occidentalis*), giant bulrush (*Scirpus californicus*), and willow trees (*Salix nigra*) and shrubs have also been located around Lacassine Pool. White-faced (*Plegadis chihi*) and white ibis (*Eudocimus albus*); great (*Ardea alba*), cattle (*Bubulcus ibis*), and snowy (*Egretta thula*) egrets; great blue (*Ardea herodias*), Louisiana (*Egretta tricolor*), and little blue herons (*Egretta caerulea*); anhingas (*Anhinga anhinga*); roseate spoonbills; and neotropical cormorants (*Phalacrocorax brasilianus*) are a few of the more common species found on the refuge.

Table 2. Recent Peak Numbers of Waterfowl on Lacassine Refuge

Species	January 13, 2004	January 5, 2005	January 4, 2006
Mallard	26,141	2,600	13,773
Mottled	995	1,021	1,935
Blue-winged Teal	211	300	18,563
Shoveler	5,749	2,431	2,725
Gadwall	4,904	1,344	2,710
Wigeon	593	901	1,047
Green-winged Teal	28,150	46,770	47,221
Pintail	17,155	582	14,362
Wood Duck	0	0	0
Ringneck	14,984	3,394	3,650
Black-Bellied Whistling Duck	369	0	0
Lesser Scaup	42	0	0
Redhead	0	0	0
Canvasback	0	0	0
Bufflehead	0	0	300
Ruddy Duck	0	0	0
Fulvous Whistling Duck	0	0	0
White-fronted Geese	2,104	669	3,425
Snow Geese	0	1,500	0
Canada Geese	0	0	0
Coots	2,392	7,480	3,454
Ducks/Geese Total	101,397	61,512	109,711
Puddle Ducks	83,898	55,949	102,336
Diving Ducks	15,395	3,394	3,950

Source: USFWS, 2006

The refuge has a sizable breeding population of purple gallinules (*Porphyryla martinica*), common moorhens (*Gallinula chloropus*), bitterns, and rails. Dense marsh vegetation makes surveying difficult. Surveys for gallinules and moorhens are conducted in Lacassine Pool each August using an airboat and consist of six transects totaling 14.2 miles. All gallinules and moorhens within 150 feet of the transect are recorded.

Lacassine Refuge was recognized as a Globally Important Birding Area in 1998. The refuge provides habitat for globally significant numbers of white-faced ibis and waterfowl, as well as nationally significant numbers of roseate spoonbills.

Shorebirds, Gulls, Terns, and Allied Species

The region's strategic location is enhanced by a diversity of habitat types favored by shorebirds, including beaches, marsh, estuarine tidal flats, rice fields, and crawfish ponds. The refuge provides resting and feeding habitat mainly for spring migrating shorebirds. However, a tremendous number of shorebirds are attracted each fall to rice fields and crawfish ponds. Surveys are performed during fall and spring migration. Commonly present shorebirds include killdeer (*Charadrius vociferus*), long (*Limnodromus scolopaceus*) and short-billed (*Limnodromus griseus*) dowitchers, greater (*Tringa melanoleuca*) and lesser (*Tringa flavipes*) yellowlegs, black-bellied plovers (*Pluvialis squatarola*), black-necked stilts (*Himantopus mexicanus*), snipe (*Gallinago gallinago*), and sandpipers. If conditions are favorable, Forster's terns (*Sterna forsteri*), killdeers, and black-necked stilts nest on the refuge.

Raptors

Raptors of Lacassine Refuge include many species of hawks, owls, and vultures. Year-round residents include the black (*Coragyps atratus*) and turkey (*Cathartes aura*) vulture; osprey (*Pandion haliaetus*); sharp-shinned (*Accipiter striatus*), red-shouldered (*Buteo lineatus*), and Cooper's (*Accipiter cooperii*) hawks; American kestrel (*Falco sparverius*); and barn (*Tyto alba*), great horned (*Bubo virginianus*) and barred (*Strix varia*) owls (USFWS 2002a 1989). Additionally, the golden eagle (*Aquila chrysaetos*), a state-listed rare species, has been routinely recorded from Lacassine Refuge and vicinity.

Other Migratory Birds

Lacassine Refuge is not as heavily used by migrating neotropical birds as the coast proper of Louisiana. The refuge is not the first landfall the birds reach following their migration across the Gulf of Mexico. The encroaching, non-native Chinese tallow (*Sapium sebiferum*) has decreased the value of the habitat to neotropical birds. The refuge has limited acreage that can support the preferred species of trees and other vegetation important to neotropical migratory birds. Currently, some levees are being cleared of tallows and are being replanted with native tree species. Mourning doves (*Zenaida macroura*) are commonly seen along fencerows, levees, roads, and fields of the refuge. Yellow-headed (*Xanthocephalus xanthocephalus*) and rusty (*Euphagus carolensis*) blackbirds are rare species of the refuge. The red-winged blackbird (*Agelaius phoeniceus*) and boat-tailed grackle (*Quiscalus major*) are found on the refuge in abundance.

Mammals

Lacassine Refuge provides suitable habitat for armadillos, rabbits, squirrels, nutria, mink (*Mustela vison*), muskrats (*Ondatra zibethicus*), skunks, opossums (*Didelphis virginiana*), otters (*Lutra canadensis*), raccoons, coyotes, and whitetail deer (*Odocoileus virginianus*). It is estimated that the

deer population on the refuge is approximately 300 individuals. Approximately 50 percent of the refuge or 16,000 acres can be considered deer habitat. The Louisiana Department of Wildlife and Fisheries estimates that excellent freshwater marsh habitat can support a potential density of one deer per 30 acres. On Lacassine Refuge, this species is concentrated on the spoil banks and agricultural fields found throughout the refuge. Deer utilize marsh areas primarily for feeding and escape cover. Cottontail (*Sylvilagus floridanus*) and swamp rabbits (*Sylvilagus aquaticus*), are found on the refuge in abundance. A recent study shows that both rabbits breed throughout the entire year at this latitude and the number of rabbits produced annually in this type of habitat is greater than that of rabbits in more upland habitats. Even though many predators prey on these rabbits, their population numbers are considered high. The annual harvesting of rabbits from the refuge has no negative impacts on the population and allows opportunities for recreational hunting.

Amphibians and Reptiles

As a freshwater marsh, Lacassine Refuge is a haven for reptiles and amphibians. Despite the dominance of these creatures in the landscape, little is known about their populations on the refuge (the American alligator [*Alligator mississippiensis*] is the only member of this group that is managed). In 2001, the refuge began participating in a statewide monitoring program for frogs known as the Louisiana Amphibian Monitoring Program. Three permanent sites have been established and are monitored during specific periods of the year.

In addition to the amphibian monitoring program surveys, drift fences have been in place on the refuge since 2001, to monitor terrestrial reptiles and amphibians. The refuge has plans of expanding its reptile and amphibian monitoring effort to determine the effects of oil and gas development on these sensitive species. Drift fences and other survey techniques are planned to monitor reptile and amphibian populations on sites disturbed by oil and gas development, as well as controlled sites in the marshes east of the pool.

Little is currently known about reptile and amphibian populations in Lacassine Bayou. This habitat should support a different assemblage of species than are found in the pool. The bayou is also known to harbor alligator snapping turtles, which have been identified as a species of concern (USFWS 2003).

Lacassine Refuge provides suitable habitat for a large population of alligators. Alligators are opportunistic carnivores and a top predator on the refuge. Alligator populations have been managed in most areas of the state by a harvest program that is closely regulated by the Louisiana Department of Wildlife and Fisheries, a program in which Lacassine Refuge has been a participant. The refuge's harvest program has followed the state's recommendations; in some years the harvest has been below the allotted quota. Nest densities are much higher in Lacassine Pool in comparison to the fresh marshes located outside the pool. The 5-year average (1997-2001) nest density for Lacassine Pool is one nest per 43 acres, while the 5-year average nest density outside the pool is one nest per 106 acres.

Aquatic Species

Fish species present include catfish, bowfin, bass, bream, crappie, and gar. Fish populations of Lacassine Refuge have periodically suffered from the negative effects of drought. In the early 1990s, levees were upgraded so that the level of the Lacassine Pool could be raised from 4 to 5 feet mean sea level. The deeper water areas provide a more stable water quality (e.g., temperature and dissolved oxygen) that supports better fish habitat. As a result, fishing grew increasingly popular with the public; fishing tournaments became a common, almost weekly, event on the refuge. The severe

droughts of the late 1990s and early 2000s essentially dewatered Lacassine Pool. Creel surveys are conducted at Lacassine Pool during the months the area is open for public fishing. The refuge does not closely monitor aquatic species outside of Lacassine Pool.

Non-native Plant Species

Also known as exotic species, they pose problems at Lacassine Refuge because they displace native vegetation, which native fauna depend on. There are several invasive species present on the refuge, with the Chinese tallow being the most prevalent. In Louisiana, old fields and pastures that once provided grassland bird habitat are being replaced with forests of the exotic, invasive Chinese tallow.

Tallow trees typically grow on elevated and undisturbed ground along fencerows and levees. Refuge staff have worked to eliminate Chinese tallow from some levees, and to replant with native species. Chinese tallow control is a major management concern for the refuge, with prescribed burning and herbicides used to control it. However, this exotic is a very resilient species, and tends to re-sprout after the herbicide is applied. Its coppicing ability also restricts the usefulness of fire as a control measure, although studies have found that in areas with sufficient fuel, such as in prairies with good grass cover, summer burns kill or top-kill trees as tall as three meters (TNC 2003). Other non-native, including non-invasive, species are water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), common salvinia (*Salvinia minima*), hydrilla (*Hydrilla verticillata*), alligator weed (*Alternanthera philoxeroides*) (USFWS 2000), bamboo (species unknown), Chinaberry (*Melia azedarach*), St. Augustine grass, Bermuda grass, and Lantana (*lantana camera*).

Non-native Animal Species

The most invasive animal on the refuge is the nutria. The nutria is an exotic herbivore that can cause significant damage to marsh habitats when populations become elevated, an event referred to as eat-outs. Currently, nutria populations throughout the refuge and in the general area are relatively low, causing minimal damage to habitats requiring a minimum of population control. Change in vegetative communities outside of Lacassine Pool may occur again in future years. With favorable habitat conditions and the nutria's high reproductive potential, the population can expand rapidly. Although nutria can be destructive to levees and vegetation, the species is beneficial in that it is available as a food source for alligators, coyotes, and bobcats (USFWS 2003).

No exotic reptiles and amphibians are known to occur on Lacassine Refuge but a few are established in nearby parishes and others are expanding their range out of Florida. Of special concern is the brown anole (*Anolis sagrei*) that displaces native green anoles (*Anolis carolinensis*). Efforts are made to monitor reptile and amphibian populations; however, little may be done to stop species, such as the brown anole, once established (USFWS 2003). The domestic cat (*Felix catus*) has established wild, free-roaming populations throughout most of the United States. Feral cats can be devastating to native birds, but they also prey very heavily on other native wildlife, such as snakes, lizards, and rabbits. What effect feral cats have on the refuge's wildlife population is unknown. The Eurasian collared dove (*Streptopelia decaocto*) occurs on the refuge, but apparently is harmless to other species.

HABITATS: (INCLUDES LACASSINE POOL)

Lacassine Refuge is located on the boundary of the coastal marsh and agricultural habitats. The dominant feature of the refuge is the Lacassine Pool, which was created by enclosing a 16,000-acre marsh with a low levee during the 1940s. The refuge consists predominately of freshwater marsh, wetlands, and croplands (Figure 4).

Table 3 shows a breakdown of land cover/habitat types on the refuge.

Much of the refuge is impounded and is divided into management units (Figure 5) that are both impounded (Units A, B, C, D, E1, F3, and G) and unimpounded (Units E2, F1, F2, H, I, and J). About 3,300 acres south of the Gulf Intracoastal Waterway is designated as wilderness.

Table 3. Land cover/habitat types on Lacassine Refuge

Habitat/Cover	Approximate Acres
Impounded Fresh Marsh (Lacassine Pool)	16,000
Natural (Unimpounded) Fresh Marsh	14,700
Forested wetlands	352
Shrub wetlands	348
Open Water	1,048
Managed Fresh Marsh (moist-soil plant impoundment)	307
Coastal Prairie	334
Croplands (rice and fallow)	1,109
Roads, levees, miscellaneous	526
Total Acres	34,724

Source: USFWS 2003

Lacassine Pool

The most prominent feature on the refuge is the 16,000-acre impounded fresh marsh known as the Lacassine Pool (Unit G), which provides sanctuary and food for thousands of ducks, geese, shorebirds, and wading birds in peak years. The pool is also a popular fishing area and is heavily utilized during the fishing season.

Pool levees were constructed to maintain a maximum water elevation of 4.0 feet mean sea level (MSL) and staff gauges were installed in the pool to monitor water elevations. This elevation information was established by interpreting historic data found in refuge files. The pool elevation water level of 4.0 feet MSL that was established during the 1940s, and carried throughout the years in numerous surveys and documents, has always been assumed to be the correct water level elevation. To date, research of the historic data to locate the origin of this elevation has proven unsuccessful. Whether the origin of this elevation datum was surveyed by a professional surveyor, estimated from maps, or just visually estimated can only be assumed.

Figure 4. Habitats of Lacassine National Wildlife Refuge

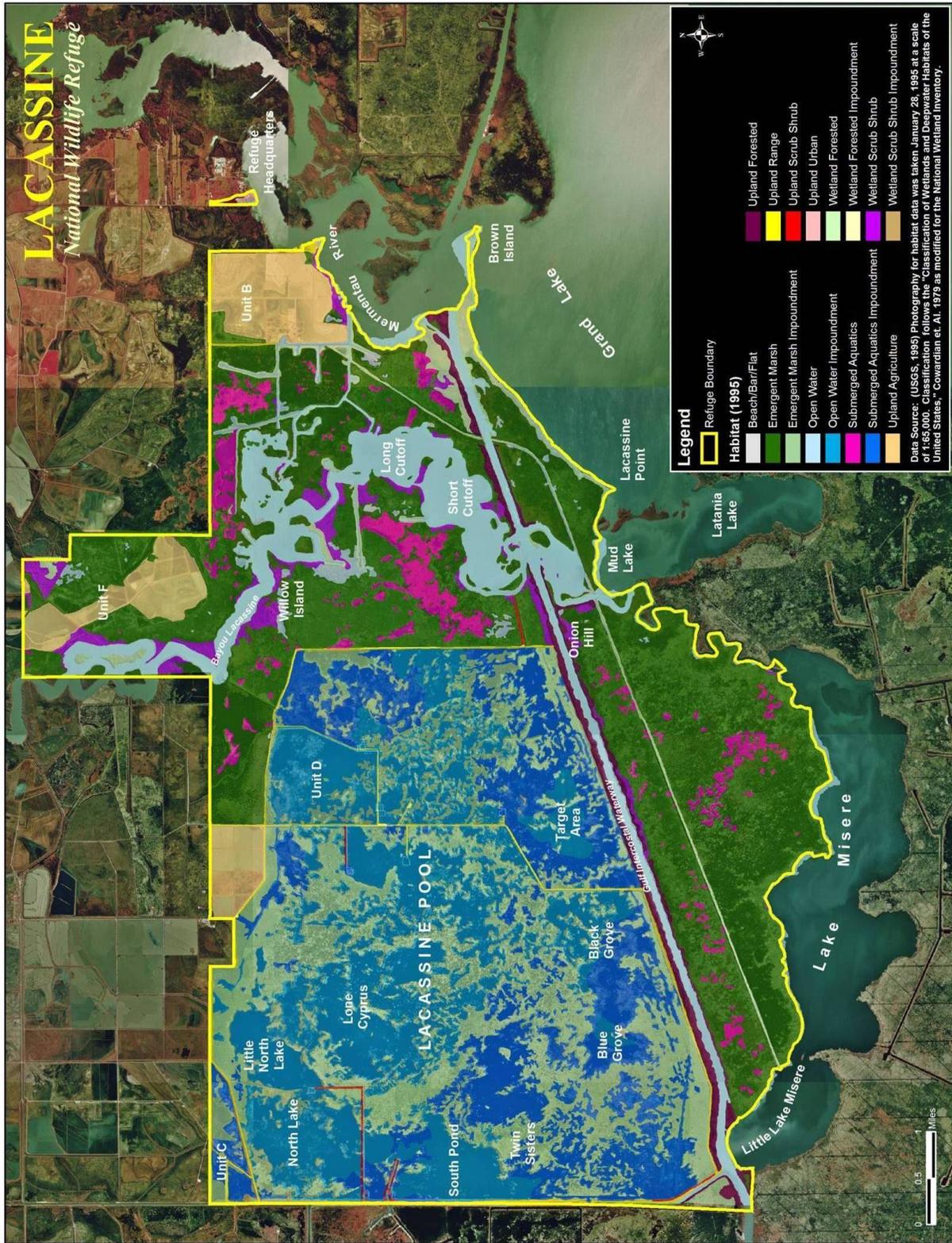


Figure 5. Management Units on Lacassine National Wildlife Refuge



In 2005, John Chance Land Surveys, Inc., was tasked to perform a new survey to gain better insight into management of water levels in the pool area. This survey was conducted using the best available science for data acquisition and adjusted to the latest accepted horizontal and vertical data. The final adjusted results of this Global Positioning System (GPS) survey revealed that there is a 3.1-foot difference between the historic accepted Lacassine Refuge vertical datum (assumed to be MSL) and the survey contractors GPS-derived elevations using North American Vertical Datum of 1988 (NAVD88). The latest vertical adjustment at Lacassine Refuge was determined from a fully constrained adjustment fixed to three of the National Geodetic Surveys Continuously Operating Reference Stations and using the latest validated geoid model (Geoid03 - 2004.65) for elevation determination in the Louisiana Coastal Zone.

New staff gauges have been installed at the three water control structures (within the pool) and are calibrated to the latest NAD83 horizontal datum and NAVD88 vertical datum. Managers of the pool will now be using the NAD83 and NAVD88 reference data and will report the accepted datum for water levels accordingly. Water levels will still be managed at a level that will not negatively affect the dikes and is still conducive to migratory birds and sport fisheries in the pool.

The pool has never been managed as a seasonally flooded moist-soil management area. There are no capabilities to flood the area other than through natural precipitation. Gravity flow dewatering is possible through three stop-log water control structures located on the north, southeast, and southwest portions of the pool levee system. Early literature and documents discussing the pool since its construction in the early 1940s have never clearly indicated how the pool should be managed to provide sanctuary for wintering waterfowl.

Not being able to take advantage of dry weather conditions and applying prescribed fire to the pool at the appropriate time of the year has been the downfall of past and current pool management actions. In addition, the complexity of managing for waterfowl and fish is a very dynamic public process. In the past, if an annual drawdown was artificially induced by refuge management, it had to be applied to the entire pool, which significantly affected access to the recreational fisheries resource. Trying to manage for waterfowl and recreational fisheries access over the decades has now resulted in the accumulation of more than 60 years of dead plant material, which is surfacing as a significant management issue.

In an effort to manage the pool for both wintering waterfowl and fully aquatic species (e.g., fish for recreational fishing), water levels are maintained at full pool, or as close to it as possible, during the spring and summer months. In the winter, water levels are lowered so the waterfowl foods that are produced can be made more available to waterfowl. This water level regime is highly dependent upon weather conditions in any given year. A hurricane or tropical depression can completely flood the area for an entire year. A heavy spring rain can do the same. A severe drought can do the complete opposite so refuge managers must be flexible and have the ability to work with the dynamic weather conditions of the area.

Though the pool is recognized as a feeding area for some species of waterfowl, one of its most important contributions to wintering waterfowl is serving as a sanctuary and resting area for pintails. Recent research has documented the value of the pool as a key diurnal roost site for harboring pintails in southwest Louisiana, with pintails making frequent long, round-trip journeys to foraging habitat at night (Cox and Afton 1996). Based on an experimental site within the pool (Unit D), the current water management regime along with 10-year, cyclic water drawdowns followed by prescribed burning and then flooding appears to stimulate the growth of the aquatic plant *Brasenia* or water shield, which is characterized as an excellent food for ringed-necked ducks, but of only fair value for other waterfowl. It also allows for oxidation of dead plant material. This management

treatment, if continued, should allow for the growth of *Brasenia* (e.g., water shield) and other beneficial waterfowl food plants, create loafing areas for waterfowl, maintain sanctuary for wintering waterfowl, and maintain fisheries habitat and customary and traditional access to recreational fishing. This is one of many management strategies that may be applied to the pool as the refuge develops an adaptive water management plan.

Fire management has played a very important role in maintaining the pool in the past. Former managers prescribed burned units on a three-year rotation, such that the entire pool was burned every three years. However, the majority of these burns were conducted during the winter months and it is questionable as to how well the burns did in controlling nuisance vegetation, such as maidencane. The burns did aid in controlling hazardous fuels and controlling some woody vegetation in the pool.

Forest

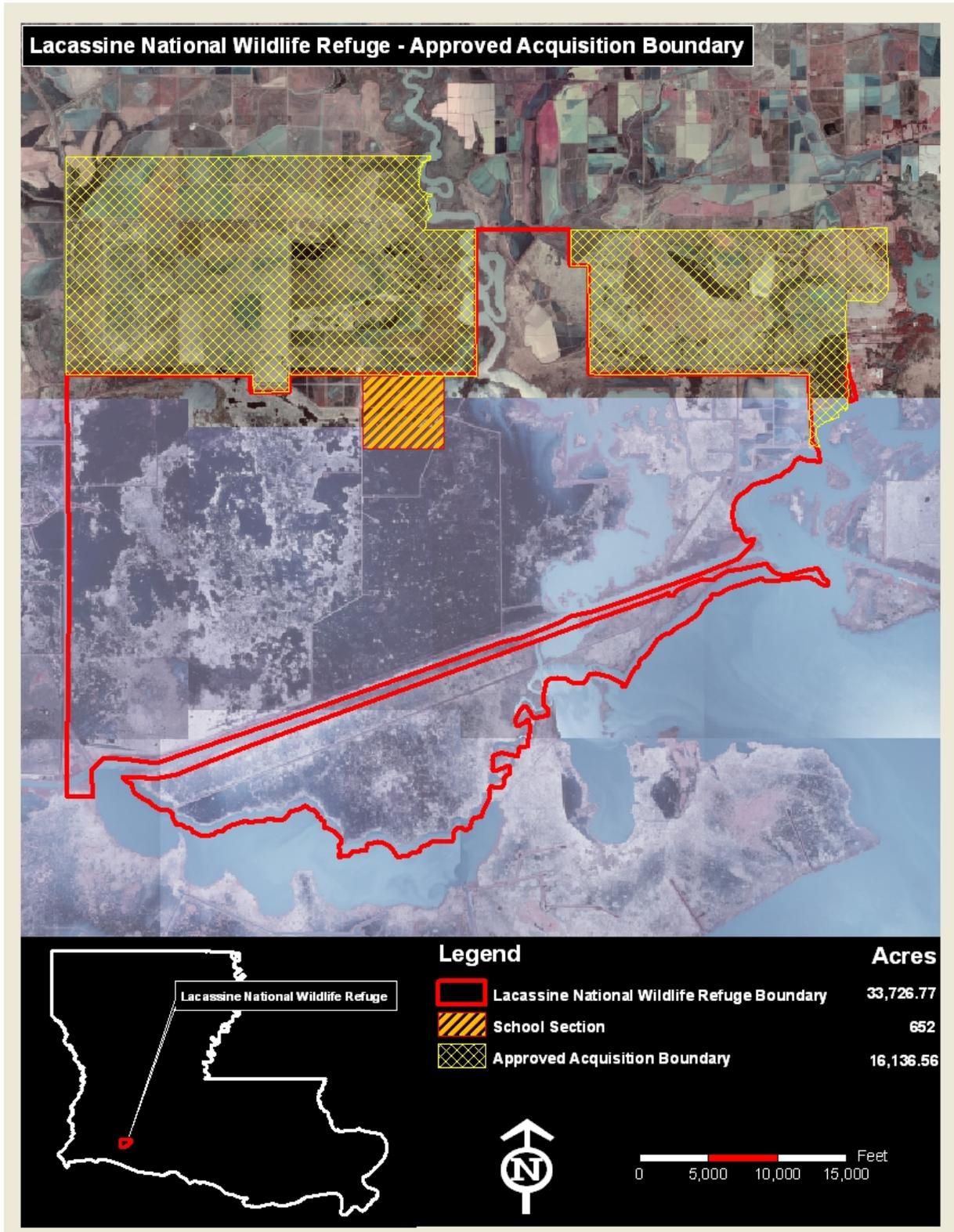
A limited bottomland hardwood forest (e.g., approximately 400 acres) is present on the refuge, primarily in the riparian areas along the Mermentau River and Lacassine Bayou. There may be opportunities for forest restoration on the existing refuge, and for acquisition of additional bottomland hardwood forests within Lacassine Refuge's acquisition boundary (Figure 6). Additional woody vegetation is present on canal and stream banks, and also on a series of ring levees in Lacassine Pool that are associated with former oil and gas exploration sites. Chinese tallow, an invasive exotic plant species, is a dominant woody species on the ring levees. Refuge staff have worked to eliminate tallow from some levees, and to replant native species, such as bald cypress, tupelo gum (*Nyssa aquatica*), black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), common persimmon (*Diospyros virginiana*), sugarberry (*Celtis laevigata*), live oak (*Quercus virginiana*), Nuttall oak (*Quercus nuttalli*), swamp dogwood (*Cornus foemina*), red mulberry (*Morus rubra*), wax myrtle (*Myrica cerifera*), and buttonbush. The staff is monitoring the use of treated ring levees as compared to control sites on other untreated levees, which remain dominated by Chinese tallows.

Prairie

The coastal prairie plant community, located along the Gulf Coast of the United States, once encompassed an estimated 8.6 million acres. Today, only a tiny fraction survives: less than 100 acres of upland prairie in small, narrow patches paralleling railroad tracks; and another 100 to 300 acres of wet prairie in disjunctive remnants on private land.

Like Midwestern prairies, coastal prairie is dominated by grasses, such as little bluestem (*Schizachyrium scoparium*), gamma grass (*Tripsacum dactyloides*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), and big bluestem (*Andropogon gerardii*). Coastal prairies are diverse with over 500 species of grasses, sedges, and wildflowers. However, coastal prairie is distinct in several ways, including the presence of species that are not found in the Midwestern prairies, such as slender bluestem (*Schizachyrium tenerum*), brownseed paspalum (*Paspalum plivatulum*), and sweet goldenrod (*Solidago odora*). Prairie nymph (*Herbertia lahue*), Oklahoma grass pink orchid (*Calopogon oklahomensis*), and prairie parsley (*Polytaenia nuttalli*) are a few of the rare species found in coastal prairie habitat.

Figure 6. Approved acquisition boundary of Lacassine National Wildlife Refuge



The need for restoring and conserving coastal prairie is clear but the scale of restoration adequate for conserving prairie biodiversity has not been determined. A useful approach is to manage for sensitive animal species considered indicators of environmental stress. From an ecological point of view, recruitment of grassland birds to restored prairie may be an indicator of the restoration of ecosystem function (USFWS 2003).

Croplands

Management of the 307-acre Unit A began with farming in 1950 and continued with either cooperative farming or refuge farming until 1981. The refuge continued farming Unit A in a rotation with moist-soil, rice, millet, milo, and green browse through 2000. In 2001, the refuge reworked levees and water control structures in Unit A to improve water management capability in the eight fields that range in size from 12 to 48 acres. Water can usually be gravity-flowed into Unit A from the pool. A two-way pump is used to drawdown these fields and to provide a reliable method for flooding the unit.

Unit B is a 724-acre area, which includes 579 acres of rice impoundments that have been managed since 1990 by a cooperative farmer. Rice is planted in a field every other year, alternating with wheat, rye grass, or fallow. The farmer harvests the first crop of rice and leaves the second crop for waterfowl, which works out to be about 20-25 percent of the total rice crop. Wheat or rye is planted as green browse for wintering geese.

The refuge acquired the 530-acre Unit F in 1996, and, since then, it has been cooperatively farmed similar to Unit B. On average, 327 acres of rice are planted in a field every other year, alternating with wheat, ryegrass, or fallow.

Early Successional Wetland Management

One unit of about 300 acres is available in Unit A and managed as early successional wetlands (e.g., moist-soil habitat). Historically, this unit has been managed on a three-year rotation. Grain crops have been grown in the unit one year out of three to produce high-value waterfowl food, while setting back plant succession. Early successional wetland management is time consuming and often requires swift management action to address plant responses during the growing season.

In Unit C, farming was discontinued in 1981. In 1993, the refuge planted rice in the western portion of the unit and began managing it as an early successional wetland. The refuge plans to convert the western section of Unit C into early successional wetland habitat.

EDUCATION AND VISITOR SERVICES

The six priority general public uses of Lacassine Refuge are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Visitor facilities are shown in Figure 7.

These wildlife-dependent uses are the Service's primary focus for the development of visitor use programs to increase visitor awareness and appreciation of fish and wildlife resources on national wildlife refuges. These priority general public uses are described in more detail in the following paragraphs.

Figure 7. Current visitor facilities at Lacassine National Wildlife Refuge



Lacassine Refuge provides activities for more than 38,000 visitors annually (USFWS 2004). Until visitor facilities are improved, the preponderance of visitation will likely continue to be for recreational fishing and hunting. Until then, the more adventuresome will still come to drive its limited road system and to hike some of its miles of levees. There are no designated hiking trails on Lacassine Refuge; however, visitors are permitted on about 30 miles of refuge levees and service roads at the Lacassine Pool and Unit B.

The refuge has no visitor center or tour route and the headquarters area is separated from the refuge proper. It is proposed to have exhibits in the Southwest Louisiana National Wildlife Refuge Complex Visitor Center, located at Cameron Prairie National Wildlife Refuge, that will highlight Lacassine Refuge.

Hunting and Trapping

Currently, waterfowl hunting is allowed on 10,434 acres. The farm unit on Unit B is a lottery hunt area for senior hunters on Wednesdays, and youth hunters on Saturdays, and is open during the second split of the state waterfowl season. The Duck Pond lottery hunt is open for adult hunters on Wednesdays and Saturdays during both splits of the state waterfowl season. The general public hunt area is open Wednesday through Sunday for teal season and both splits of the regular state season. All hunters are required to obtain a hunting brochure, which serves as a permit when signed. Archery deer hunting is permitted annually during October on the entire refuge, excluding the headquarters area and the wildlife drive.

The refuge receives its alligator trapping quota from the Louisiana Department of Wildlife and Fisheries.

Fishing and Boating

Fishing has been the most popular recreational activity since the refuge was established. The Lacassine Pool, created to provide migratory waterfowl habitat, has become a prime largemouth bass fishing area. Fishing tournaments have occurred on the refuge for a number of years. Persons participating in past tournaments have been encouraged to practice catch and release techniques by tournament sponsors.

Two boat ramps are available at Lacassine Pool for ingress and egress to interior fishing waters. Anglers are required to use launches off the refuge to access areas other than Lacassine Pool. The refuge impoundment is restricted to 25 horsepower motors. The Unit D impoundment within the pool is restricted to non-motorized boats. Canals and major bayous outside the impoundments have no restrictions on boat motor size. Only push poles and paddling are allowed in the marsh (USFWS 2002c).

Wildlife Observation and Photography

There is a three-mile auto tour with interpretive signs at the Lacassine Pool public use area (Unit D). Pull-offs are located along the drive to allow other visitors to continue along the drive. Visitors are encouraged to remain in their vehicles to minimize disturbance of wildlife and to enhance viewing. State Highway 14 passes by the refuge and is designated as the Jean Lafitte Scenic Byway. Visitors can hike along levees for additional wildlife observation opportunities. A cypress swamp observation deck is located at the headquarters. The refuge has two viewing platforms located at the Lacassine Wildlife Drive and Unit B. The platforms are well placed to see optimum wildlife populations while limiting disturbance to wildlife.

Environmental Education and Interpretation

Environmental education programs are not available on-site because limited staff and facilities do not allow for such programs. However, limited environmental education programs are currently brought into local schools. Students view a slide program, participate in a short activity, and receive an educational package. No formal training has been done to encourage local educators to lead and teach environmental education programs on site (USFWS 2002c).

REFUGE ADMINISTRATION

Refuge administration refers to the operation and maintenance of refuge programs and facilities.

Refuge Staff

Lacassine Refuge was administratively combined with nearby Cameron Prairie and Sabine National Wildlife Refuges in April 2004, to form the Southwest Louisiana National Wildlife Refuge Complex. Shell Keys National Wildlife Refuge was added to the Complex in December 2005. Cameron Prairie Refuge serves as the Complex headquarters. Various positions throughout the Complex have or will be targeted as positions with Complex-wide responsibilities. The Complex staff will support, direct, and manage the needs, resources, and staff of Lacassine, Cameron Prairie, Sabine, and Shell Keys National Wildlife Refuges.

Lacassine Refuge staff consists of 6 permanent employees, with occasional interns, volunteer workers, and term appointments, supervised by the Refuge Manager. Positions include one Project Leader, one Wildlife Biologist, one Law Enforcement Officer, one Office Automation Clerk, one Heavy Mobile Equipment Operator, and one Maintenance Worker (USFWS 2006). A Complex Project Leader stationed at the Complex headquarters at Cameron Prairie National Wildlife Refuge supervises the Lacassine Refuge Manager.

COORDINATION/COOPERATIVE PROGRAMS

The refuge staff coordinates and cooperates extensively with state agencies, tribes, landowners, the public, conservation groups, oil and gas companies, and local agencies and organizations. Lacassine Refuge is a component of several important regional or ecosystem planning and management efforts, and works with all levels of government and non-governmental organizations and private citizens to accomplish goals and objectives specific to those efforts.

FACILITIES AND EQUIPMENT

Facilities at Lacassine Refuge include those visitor facilities mentioned above, most of which are around Lacassine Pool. At the headquarters area, a new office building has recently been completed. The refuge has no visitor center per se and has no plans for one during the life of this comprehensive conservation plan. The headquarters area also includes some staff housing – two houses and trailers – in addition to a maintenance shed and equipment storage area. Table 4 lists the refuge's equipment.

Table 4. Equipment at Lacassine National Wildlife Refuge

Amphibious Marsh Master	Forklift, Pettibone 10,000 LB
Amphibious Excavator, long reach on pontoons	Tractor, Buhler 4WD, 145 PTO HP with cab
Bulldozer, Caterpillar D-5	Tractor, Ford TW-20, 120 HP with cab
Bulldozer, John Deere 350 Crawler Wide Tracks	Tractor, Ford TW-5, 90 HP with cab
Dragline, 60' Boom, Bucket	Tractor Truck, Navistar, 4X2
Crane, Link-Belt LS-98 Crane, Crawler Mounted, GM Diesel engine	

Roads

Illinois Plant Road, Tidewater Road, and Streeter Road (i.e., Highway 127) provide access to the refuge. Streeter Road is the only paved road on the refuge and is maintained by the Cameron Parish Police Jury. The portion of Illinois Plant Road that is paved is maintained by the Jefferson Davis Parish Police Jury, with the graveled portion being maintained by the refuge. Parking lots located at two boat launches (e.g., Old and Tidewater) at Lacassine Pool and Unit B fishing area are also graveled. During peak fishing periods, visitors are limited by parking lot capacity. The headquarters office is accessed via Highway 3056.

RESEARCH NATURAL AREAS

Research Natural Areas are designated by federal land management agencies to preserve plant and animal communities in a natural state for research purposes. They protect vanishing native habitats that exhibit outstanding ecological value by preventing unnatural encroachments and activities that might modify ecological processes. At this time, Lacassine Refuge has no designated Research Natural Areas.

WILDERNESS REVIEW

As part of the planning process, lands within the legislative boundaries of Lacassine National Wildlife Refuge were reviewed for wilderness suitability. About 3,300 acres south of the Gulf Intracoastal Waterway were officially designated as a Wilderness Area in the late 1970s. The Wilderness Area is managed under the provisions of the 1964 Wilderness Act as a unit of the National Wilderness Preservation System. That is, it is “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain” (The Wilderness Act, September 3, 1964; [16 U.S.C. 1121 (note), 1131-1136]). Other than setting prescribed fires from helicopters, the staff carries out no active management in this Wilderness Area. Visitation by the public is permitted, but due to the area’s difficult access (by boat only), it is not heavily used.

No additional lands at Lacassine Refuge were found suitable for designation as wilderness as defined by the Wilderness Act. The refuge does not contain an additional 5,000 contiguous roadless area, nor does it have any units of sufficient size to make their preservation practicable as wilderness. The lands and waters of the refuge have been substantially altered by humans, particularly through agriculture, water manipulation, levee and canal construction, pipeline laying, oil and gas development, and seismic exploration. As a result of both extensive modification of natural habitats and ongoing manipulation of natural processes, adopting a “hands-off” approach to management at

the refuge would not facilitate the restoration of a pristine or pre-settlement condition, which is the goal of wilderness designation.

ARCHAEOLOGICAL OR HISTORICAL RESOURCES

In addition to the natural habitat and wildlife that Lacassine Refuge conserves, it also encompasses resources of archaeological and cultural value; these tell of the long story of human habitation and endeavor in the area. The refuge is located in a region with a rich human history and pre-history.

Prior to the arrival of European-Americans, it was inhabited by the Atakapa Indians. The Atakapa occupied the coastal and bayou areas of southwestern Louisiana and southeastern Texas until the early 1800s (Couser 2002). Archaeological evidence suggests that settlements have been present in this area since before Native Americans learned to make pottery, approximately two thousand years ago. While “Atakapa” means “eaters of men” in the language of the neighboring Choctaw, it is unknown whether the Atakapas’ supposed cannibalism was for subsistence or ritual. Before the arrival of European-Americans, Atakapas were hunters, gatherers, and fishers. Their society consisted of loose bands that moved on a regular basis from place-to-place within a given territory, gathering, hunting, and fishing. The alligator was very important to them, because it provided meat, oil, hides, and even insect repellent (e.g., its oil). The Atakapan language has fascinated linguists and is among the better-recorded Native American languages. At one time, it was believed to be associated with other languages of the Lower Mississippi River, but later this theory was abandoned and it is now classified as an isolated language.

Most of what is known about the appearance and culture of the Atakapa comes from eighteenth and nineteenth century European descriptions and drawings. The Atakapan people were said to have been short, dark, and stout. Their clothing included breechclouts and buffalo hides. They did not practice polygamy or incest. Their customs included the use of wet bark for baby carriers and Spanish moss for diapers. According to another custom, a father would rename himself at the birth of his first son or if the son became famous. In the creation myth of the Atakapa, humans were said to have been cast up from the sea in an oyster shell. The Atakapa also believed that men who died from snakebite, and those who had been eaten by other men, were denied life after death, a belief that may have lent support to the notion that they practiced ritual cannibalism.

The various bands of the Atakapa were reported to have traded not only with other Indians but with early French and Spanish explorers and traders as well. After the appearance of these Europeans, the Atakapa dwindled rapidly. An estimated 3,500 still survived in 1698; by 1805, only 175 remained in Louisiana. Just nine known descendants were recorded in 1909. Their downfall was brought about primarily by the invasion of and devastation from European diseases, rather than through any direct confrontation with European settlers.

The next major phase of the area’s human habitation occurred after the Treaty of Paris in 1763 concluded the French and Indian Wars (Feldman 1998). The British had already expelled French-speaking settlers—the Acadians—from Nova Scotia (in what is now one of the Maritime Provinces of Canada), in the 1755. Their exile occurred as a result of the widespread turmoil and upheaval sweeping through French and British colonies in North America as England gained the upper hand in its struggle with France for the control of North America. The Acadians first arrived in “New Acadia,” now Louisiana, then a colony of Spain, in 1764, and this migration continued for the next two decades (Hebert 2003). Even after all their wanderings after their expulsion from Acadia, the adjustment from Maritime Canada, with its sub-arctic climate and rocky, hilly terrain, to the Mississippi Delta, with its nearly subtropical climate and bayous, must have been difficult for the Acadians. Yet over time, the Acadians, later referred to as Cajuns, flourished and developed their own subsistence-based culture

based on hunting, fishing, trapping, and some agriculture, that produced a unique cuisine and music, among other things.

Southern Louisiana is also known for its Creole culture and cuisine. While the Cajuns were specifically French in origin, the Creoles trace their heritage to Spanish, African, Italian, and French influences, indeed, to any other peoples who chose to live in New Orleans (Royal Café, no date). The roots of Creole culture date to the early 1700s, with the French settlement of La Nouvelle Orleans under its founder Jean Baptiste Le Moyne, Sieur de Bienville, governor of the Louisiana Territory. In 1763, the Louisiana Territory was traded to Spain, and Spanish influence increased. German and Italian immigrants and African slaves also contributed heavily to Creole culture, cuisine, and music.

The Fish and Wildlife Service has recommended that three Indian middens found on the refuge be included in the National Register of Historic Places. One of these sites is a fairly large shell mound located at Onion Hill on Bayou Misere, which was partially destroyed during the digging on the American-Louisiana Pipeline Canal. Another is located at Lacassine Point near Grand Lake. The smallest of these sites is located on Bayou Lacassine near Short Cut-off Island.

Presently, the refuge does not have a cultural resources management plan. When one is written, it will specify what measures need to be taken at Lacassine Refuge to identify, protect, and interpret the area's rich cultural history.

LAND PROTECTION AND CONSERVATION

In keeping with the purpose for its creation, management efforts at Lacassine Refuge are oriented toward the improvement of habitats under its jurisdiction for the benefit of waterfowl, wading and shorebirds, threatened and endangered species, and other native fish and wildlife. To this end, refuge staff undertakes a vigorous program of active habitat restoration, management, and manipulation that includes levee construction and upkeep, organic layer reduction in the pool, drainage, prescribed fire, planting, and exotic plant control.

Left to the whims of the weather, many or most refuge habitats would be either too wet or too dry to be optimal for wildlife. Thus, the staff is always attempting to improve water level management on the refuge through a variety of means. For example, in 2001, the refuge reworked levees and water control structures in Unit A to improve water management capability in the eight fields that range in size from 12 to 48 acres. Water can usually be gravity-flowed into Unit A from the pool.

LACASSINE POOL

Biologists refer to the pool as a closed aquatic ecosystem. This means there are no tidal influences or flushing activities to aid in dispersing the tons of dead plant material generated each year within the pool. Water is replenished by rainfall. When constructed in the early 1940s, the pool was designed to be managed at approximately 4 feet MSL. There are deeper areas (e.g., lakes) within the pool that reach 7 feet in depth when its three spillways are set approximately 4 feet MSL.

Over a period of 60 years, dead plant material has accumulated and altered the entire aquatic community. Grasses have thrived and in some areas, woody vegetation has begun to grow. Without some form of intervention, the pool will continue to fill in, be overtaken by undesirable plants, open water areas will disappear, and the utilization of the area by migratory birds will significantly diminish. In addition, the excellent fisheries resource that has developed through appropriate water management from the early 1940s until 1992 will be lost to future generations. Many local residents

have observed these events happening over the years and have voiced their concerns. Over the years, several biologists and teams have gathered to address the management of the Lacassine Pool. Investigations and concerns date as far back as 1953.

Fish and Wildlife Service Fisheries Biologist, David Fruge (Fruge 1974), reported in August 1974 in a wildlife management study titled, "The Vegetation of Lacassine Pool:"

"The three small, elevated spillways allow a negligible amount of the tremendous annual crop of plant matter to escape from the impoundment. The resultant accumulation of this detritus therefore will cause aggradations of the substrate with consequent lowering of water levels, and continuing emergence of pop-ups, with resultant colonization by emergent species and consequent elimination of open water areas and the associated floating-leafed submergent community. This process was noted in refuge records as far back as 1953."

Fish and Wildlife Service Fisheries Biologist, Jacob Valentine (Valentine 1979), reported in November of 1979:

"The Pool has been in existence for about 36 years. The accumulation of organic material laid down by generations of plants is proceeding at a greater rate under impoundment than in the adjacent marshes. Under natural conditions, marshes are subject to drying which reduces the organic material by oxidation. The accumulation of peat-mucks reduces the water holding capacity of the impoundment, and ultimately the vegetation would succeed to a totally emergent plant community."

In 1993, the refuge manager experimented by raising the water level by approximately 1 to 1.5 feet to see if the vegetation, which was choking out the boat passageways and the open water areas of the pool, would be drowned out. After several years, the refuge staff discovered that the higher water level did not help and actually may have contributed to the problem. Also, the elevated water level was putting pressure on the dikes, which were not designed to hold water at that higher elevation.

Background reading material (USFWS 2002d) prepared by Fish and Wildlife Service staff for a team of veteran natural resource managers and biologists gathered to evaluate current management practices and provide recommendations about future habitat and water management in 2002 stated:

"In 1993, the low part of the south levee was raised again and logs were added to raise the pool to 5.0 msl. This was done to increase water depth to former levels and to test the theory that higher water levels would stress emergent vegetation. Success was short lived as the vegetation recovered and organic levels continued to increase."

During a Wildlife and Habitat Management Review conducted at Lacassine National Wildlife Refuge in 2002, it was the general consensus among most biologists, familiar with the pool, that it is filling with vegetation, which decreases water depth and diminishes water volume.

Ring levees constructed in the pool for oil and gas exploration have become infested with 20- to 30-year-old Chinese tallows. These tallows were treated with the herbicide Arsenal in 2001, and the levees replanted during February 2002, with woody vegetation more preferred by passerine birds, including bald cypress, sugarberry, red maple, common persimmon, black gum, sweetgum, Nuttall oak, and buttonbush.

The storm surge from Hurricane Rita in September 2005, which affected all of the marshes and waterways of southwest Louisiana, also affected Lacassine Refuge, including the Lacassine Pool.

Fish kills caused from low dissolved oxygen levels in the water have been observed in the pool and adjacent marshes. Dikes and water conveyance infrastructure were weakened. The entire refuge was inundated by saltwater and littered with debris, some containing hazardous materials. Strategies found in this document would be implemented to counter-effect the damages caused by Hurricane Rita.

Duralde Prairie

The refuge currently plays a significant role in coastal prairie restoration and is working closely with the Cajun Prairie Habitat Preservation Society to restore this unique, threatened habitat. The refuge, with partners, is in the process of actively restoring a significant acreage of coastal prairie on a former Farm Service Agency property, known as Duralde Prairie. This effort adds to the knowledge of prairie restoration technology and increases the sources of plant material, both of which are limited.

SOCIOECONOMIC PROFILE

Lacassine National Wildlife Refuge is located in 1,313 square-mile Cameron Parish, Louisiana, one of the largest parishes in the state. Cameron Parish is situated in the extreme southwestern corner of Louisiana, abutting the Gulf of Mexico to the south and Texas to the west. In 2003, the population of the parish was estimated at 9,708, a slight decline (3 percent) from the 2000 Census (USCB 2004). The median household income of the parish in 1999 was \$34,232, compared to \$32,566 for Louisiana as a whole. The same relative prosperity is reflected in a poverty rate below the state average. Approximately 12 percent of Cameron Parish residents lived below the poverty line in 1999, compared to almost 20 percent for all of Louisiana. Educational attainment is below the state average however, with only 8 percent of the population aged 25 or higher having a Bachelor’s degree or higher, as opposed to the statewide average of 19 percent.

In 2003, transportation and warehousing was the largest of 20 major economic and employment sectors in the parish (STATS Indiana 2004). The Census Bureau classified occupations in Cameron Parish as shown in Table 5.

Table 5. Occupations of employed civilian population 16 years and older in Cameron Parish (2000)

Occupation	Number	Percent
Management, professional, and related occupations	772	18.5
Service occupations	718	17.2
Sales and office occupations	954	22.8
Farming, fishing and forestry occupations	199	4.8
Construction, extraction and maintenance occupations	594	14.2
Production, transportation, and material moving	947	22.6

Source: U.S. Census Bureau, Census 2000, Summary File 3, Profile of Selected Economic Characteristics

In terms of employment by industrial sector, the primary industries lumped as “agriculture, forestry, fishing and hunting, and mining” predominate in Cameron Parish, as shown in Table 6.

In terms of its racial and ethnic breakdown, as reported in the 2000 Census, Cameron Parish is 92.5 percent white, non-Hispanic, 3.9 percent black or African American, 0.4 percent American Indian, 0.4

percent Asian, and 2.2 percent Hispanic or Latino origin (USCB 2004). (The percentages do not add up precisely to 100 percent because of the difference between designated races — white, black, Native American, and Asian — and ethnicities, which are Latino and non-Latino.) In addition, 1.6 percent in the Census reported some other race or two or more races. Overall, the population of Cameron Parish has a greater percentage of non-Hispanic whites (92.5 percent) than the state as a whole (62.5 percent). That is, it is less diverse and has fewer minorities.

Table 6. Employment of civilian population 16 years and older by industry in Cameron Parish (2000)

Industry	Number	Percent
Agriculture, forestry, fishing and hunting, and mining	696	16.6
Construction	470	11.2
Manufacturing	295	7.1
Wholesale trade	143	3.4
Retail trade	426	10.2
Transportation and warehousing, and utilities	396	9.5
Information	52	1.2
Finance, insurance, real estate, and rental and leasing	155	3.7
Professional, scientific, management, administrative, and waste management services	206	4.9
Educational, health and social services	677	16.2
Arts, entertainment, recreation, accommodation and food services	269	6.4
Other services (except public administration)	213	5.1
Public administration	186	4.4

Source: U.S. Census Bureau, Census 2000, Summary File 3, Profile of Selected Economic Characteristics

REFUGE RELATED PROBLEMS

INTRODUCTION

Marsh loss is the most ominous problem faced by land managers in coastal Louisiana and Lacassine Refuge is no exception. Lacassine Refuge has to gradually eliminate or at least slow down the marsh loss on the refuge or there may not be a Lacassine Refuge for future generations to enjoy. Of all the problems faced by the refuge, this is the most expensive to solve. It cannot be done without cooperation from adjacent landowners, state and federal agencies, the academic community, and ultimately the public.

UNDESIRABLE OR INVASIVE SPECIES

Non-native invasive species are causing significant damage to the refuge’s natural, managed, and agricultural ecosystems. Chinese tallow is the most prevalent and its control is a major management concern for the refuge. Water hyacinth, common salvinia, hydrilla, and Macartney rose (*Rosa bracteata*) are other common invasive species that infest the refuge.

EARLY SUCCESSIONAL WETLANDS (MOIST-SOIL UNITS)

There is a need to improve the refuge's capability and flexibility to manage several of the impoundments and early successional wetland (moist-soil) sites through better water control and vegetative control methods. Optimal early successional wetland management requires very precise methods to control water levels, such as pumps, wells, irrigation, and leveling.

CONTAMINATION

The greatest contaminant issues are related to agricultural and urban pesticide use and mercury. Much of the watershed and area surrounding Lacassine Refuge is agricultural, primarily rice. There is a possibility that some of the pesticides proposed and/or used for rice cultivation could have impacts on the refuge as they accumulate in the watershed and flow through the refuge in Lacassine Bayou or other surrounding waterbodies. Airborne contaminants could find their way into the pool and accumulate due to the lack of flushing typical of most marshes.

OIL AND GAS ACTIVITIES

General Information

The Fish and Wildlife Service does not hold mineral rights on the majority of the refuge. Consequently, Lacassine Refuge has had oil and gas exploration and production since its inception in 1937, with a total of 82 wells drilled on refuge property. Currently, only two of those original 82 wells are in production. Most of the wells that were drilled have been properly plugged and abandoned, but five of the remaining wells are listed in the "shut-in" status. A "shut-in" well is not producing and either has mechanical problems down hole, or is not economically feasible to produce hydrocarbons. Most of the "shut-in" wells on Lacassine Refuge have been in that status for many years. "Shut-in" wells can be a problem because wells that have received no attention after long periods of time can become potential environmental threats. Pressure can build up down-hole, and if not released, the pressure can cause blow-outs. These blow-outs can have major negative environmental implications because production, which includes hydrocarbons and highly saline produced water, can be released into the surrounding environment.

As the need for oil and gas increases, the refuge will likely find itself with additional oil and gas related activities, including wells, storage facilities, and pipelines. Additional coordination between oil companies and refuge maintenance staff is required when actively managing the units containing these pipelines. Acquisition deeds stipulated that oil and gas operations were not to interfere with the purpose of the refuge, but ultimately stated that the refuge could not prevent the sub-surface owner from exercising his rights to access and develop his minerals.

A mutually agreed upon special use permit is issued for all oil and gas operations to communicate Service expectations and environmental concerns to all operating companies.

In accordance with current Fish and Wildlife Service policy, which is derived from a July 17, 1986, Department of the Interior Solicitor's opinion and Louisiana state mineral rights law, owners of sub-surface oil and gas mineral rights must be granted a reasonable and necessary means of extraction and production. In more explicit terms the Solicitor's opinion states:

The United States has a number of rights as a surface owner of refuge lands in Louisiana:

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1. It may request the mineral owner to alter its proposed operation to accommodate existing and planned uses of the refuge, provided that the burden on the mineral owner is not unreasonable.
 2. It may insist that the mineral owner use only the minimum amount of land that is required to carry out the operations.
 3. The necessary operations that are performed on the refuge must be carried out in a manner, which is least injurious to refuge resources.
 4. Upon conclusion of each separable phase of operation, the mineral owner must restore the surface to its original condition, insofar as is practicable. This will include filling pits no longer required, leveling land, cleaning up spilled oil and salt water, reseeding, and repair or replacement of damaged improvements.
 5. Access roads damaged by the mineral operator must be put in a condition for use by the United States, although they need not be completely regraded if damage is recurring and unavoidable.

The United States may not:

1. Charge a mineral operator for excavation of dirt on the lease where the dirt is required in order to carry out the operation.
2. Charge for destruction of timber unless such right was reserved by the United States "grantor."
3. Interfere with the reasonable and necessary operations of the mineral owner.

Mitigation

The refuge completed an invasive plant control mitigation project with oil and gas funds. Approximately 110 acres were sprayed in Units D and E to control Chinese tallows.

Contamination Issues

Historically, wells were drilled using open, earthen pits for mud circulation and storage during drilling operations. The drilling mud was oil based and the cuttings that were removed from down hole have been known to contain heavy metals, naturally occurring radioactive material, and other forms of contamination. These open-earth pits were closed or capped, but remain on the refuge. Information exists on the locations of these closed pits, and plans for testing are being considered to try and detect if any leaching or other residual impacts have occurred.

Transmission Pipeline Rights-of-Way

Rights-of-way were inherited for transmission lines that traverse the refuge for the purpose of transporting oil, natural gas, synthetic liquid or gaseous fuels, or any refined petroleum-based product. Transmission lines are usually large in diameter and transport product to or from large processing plants. These pipelines do not service mineral production from sub-surface minerals, but require a corridor of refuge land for transportation. In contrast, flow lines are usually the smallest in diameter and transport raw product from individual wells, from sub-surface mineral production,

through the production separation process. Gathering lines, similar to flow lines, usually “gather” the production from multiple wells and transport it to production facilities. Permits for rights-of-way are not issued for flow lines and gathering lines.

Existing oil and gas transmission lines and their associated rights-of-way on the Southwest Louisiana National Wildlife Refuge Complex that have been in place for decades have become manageable over the years. Their long-term effects on the environment, which have been identified as creating pathways for saltwater intrusion into freshwater marshes, are being indirectly addressed through numerous wetlands management programs and laws such as the Louisiana Coastal Act, the Coastal Louisiana Wetlands Planning Protection and Restoration Act, the North American Wetlands Conservation Act, and many local government and private watershed initiatives such as the Cameron Creole Watershed Management Plan. These laws and initiatives have led to the development of significant wetland restoration projects, which have mitigated negative impacts associated with oil and gas transmission lines and associated rights-of-way.

Future Management

Existing oil and gas transmission lines on approved Fish and Wildlife Service rights-of-way currently within a national wildlife refuge will be managed as per Fish and Wildlife Service Policy 603 FW 2, in general, and explicitly, under section 2.11D, which states:

Existing rights-of-way: The Service will not make a compatibility determination and will deny any request for maintenance of an existing right-of-way that will affect a unit of the National Wildlife Refuge System unless (1) the design adopts appropriate measures to avoid resource impacts and includes provisions to ensure no net loss of habitat quantity and quality; (2) restored or replacement areas identified in the design are afforded permanent protection as part of the national wildlife refuge or wetland management district affected by the maintenance; and (3) all restoration work is completed by the applicant prior to any title transfer or recording of the easement, if applicable. Maintenance of an existing right-of way includes minor expansion or minor realignment to meet safety standards. Examples of minor expansion or minor realignment include: (1) expand the width of a road shoulder to reduce the angle of the slope; (2) expand the area for viewing on-coming traffic at an intersection; and (3) realigning a road to reduce the amount of curve.

New construction for oil and gas transmission line rights-of-way will not be permitted because they can significantly contribute to further land loss on coastal Louisiana national wildlife refuges. Canals built for the construction and repair of oil and gas transmission lines allow saltwater to penetrate further inland, particularly during droughts and storms, and can have severe effects on wetlands (Wang 1987). This is evident for the oil and gas transmission line rights-of-way, which were established in accordance with the Federal Department of Transportation and Louisiana Department of Transportation regulations already established on Sabine National Wildlife Refuge. Oil and gas transmission lines constructed since the 1940s are still readily apparent. Compaction and displacement of hydric soils during oil and gas transmission line repair or construction reduces water exchange and can result in increased waterlogging and plant mortality (Swenson and Turner 1987). Excavation necessary for oil and gas transmission line construction causes significant hydrological changes. Exposing hydric soil to oxygen changes the natural ecological processes, including chemical transformations, sediment transport, vegetation health, and migration of organisms. Furthermore, by altering salinity gradients and patterns of water flow, the natural process by which coastal marshes are replenished and protected cannot occur (U.S. Army Corps of Engineers 2004).

Restoration of coastal marsh is a priority on national wildlife refuges in the Louisiana coastal zone. Approximately \$10 million has been spent on the Southwest Louisiana National Wildlife Refuge

Complex in an effort to restore marsh. Extensive changes and alterations due to new pipeline rights-of-way could negatively affect restoration project predictability and life span. The stability created through these restoration projects could be jeopardized when major hydrologic changes occur due to new pipeline construction. Therefore, managing existing pipelines and rights-of-way in accordance with current Service policy, and state and federal law is permissible under current conditions. Any expansion beyond the current conditions would be an inappropriate use considering the current status of Louisiana's coastal wetlands and the Fish and Wildlife Service's role in managing and protecting this state's coastal resources.

REFUGE CONSERVATION PRIORITIES

During the week of May 20 - 25, 2002, a diverse team of biologists, managers, foresters, and non-Service managers/biologists participated in a Biological Review of Lacassine Refuge's wildlife and habitat. The review was multi-purpose in nature, being driven largely by the National Wildlife Refuge System Improvement Act of 1997, requiring each refuge to prepare a comprehensive conservation plan and give priority to: wildlife first; original purpose of refuge establishment; mission of the Refuge System; biological integrity; and the six priority public uses. In addition, the review enabled a more holistic look at how the refuge might accomplish numerous system-wide and landscape conservation needs.

One product of the review was a list of the refuge's top seven biological needs as determined by the biological review team. These are as follows:

1. Maintain the integrity of Lacassine Pool as a freshwater marsh (e.g., palustrine emergent/aquatic bed system) with a primary management focus on habitats and sanctuary for aquatic birds (waterfowl, wading birds, and marsh birds).
 - a. Develop management plans for the pool that include monitoring and mapping vegetation, vegetative communities, soils, water depth, depth of organic layer, etc. Completion of the Unit D study would provide important information critical to management of the pool.
 - b. Repair, recondition, or replace and maintain the three major water control structures in the pool to facilitate water management. Design and operate the structures to have a major drawdown every 7 to 10 years to dry and oxidize organic matter to extend the life of the pool.
 - c. Develop and implement a fire prescription plan for the pool that would allow the refuge to conduct a burn during drought conditions to eliminate the build-up of organic matter. This will likely require obtaining the state's and the Service's Regional Office approval for such a burn during a burn ban due to drought conditions in the general area.
2. Ensure a complex of habitat types (e.g., natural marsh, managed moist-soil or early successional wetland communities, and grain crops [preferably rice]) capable of providing the foraging, sanctuary, and special life-history needs of ducks, geese, and shorebirds that often will approach or exceed 500,000 ducks and geese during the winter season. Pintails will be a featured species for habitat management.
 - a. Provide 4.5 to 5.0 million mallard-use-days of foraging habitat in Units A, C, B, and F3. Improve early successional wetland management capabilities (e.g., pumps, water-control structures, levees, and ditches) of Units A and C to consistently produce in excess of 400 pounds-per-acre of preferred native plant seed on at least 400 acres and 50 to 100 acres of refuge-farmed or contract-farmed grain annually. In Units B

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- and F3, cooperatively farm rice (preferably) or other grain crop on at least 550 acres (or contract farm at least 300 acres on a 3-year rotation in Units B and F) annually. Accomplishment of this task would require personnel largely dedicated to moist-soil and farm management, and acquisition and maintenance of the necessary equipment.
- b. Unit A provides essential wintering waterfowl foraging habitat. The proposed visitor center and prairie demonstration site should not be placed in Unit A. An alternative site should be located that would reduce the impact to waterfowl food production and cause less disturbance.
 - c. Maintain and frequently review public use program and limitations to assure adequate protection of waterfowl sanctuary on the refuge.
 - d. Integrate fall shorebird habitat into management of Units A, B, C, and F3 to provide 100 to 200 acres of habitat during fall migration annually.
3. Work toward restoring and managing native coastal prairie habitats.
 - a. Continue working to restore, monitor, and maintain coastal prairie on the 334-acre Duralde Prairie.
 - b. Continue working with private landowners, the Cajun Prairie Habitat Preservation Society, other partners, and the Service's Realty Office to restore coastal prairie communities on private and public lands, preferably in blocks of 40 to 100+ acres. The ultimate goal would be to have numerous small tracts and one large 10,000-acre tract scattered throughout the historic range of this endangered habitat. (Initially this would require 0.5 FTE from regional private lands budget.)
 4. Increase and encourage habitat monitoring (i.e., refuge vegetation/habitat mapping) at very fine scales to track and monitor vegetation/water changes associated with management treatments and long-term trends.
 - a. Obtain fine-scale habitat maps of the refuge as soon as possible and at 10- to 15-year intervals thereafter.
 - b. Use monitoring to refine management actions that conserve and improve emergent fresh marsh habitat.
 - c. Use monitoring and research to evaluate fire management effects on marsh habitats and erosion.
 5. Improve scientifically sound biological inventory procedures, including data analysis/archiving to improve adaptive management approaches for reaching refuge objectives.
 - a. Prepare, maintain, and implement an inventory and monitoring plan.
 - b. Inventory refuge waterfowl usage/densities as recommended in Strategy J-1.2.
 - c. Locate a refuge pilot-biologist in southwest Louisiana to assist refuges with survey and monitoring.
 6. Control exotic plants and animals and associated vegetation problems via management and research, especially as it pertains to Chinese tallow.
 - a. Work to control invasives, especially Chinese tallow, with education, fire, physical removal, and spraying.
 - b. Support research that will facilitate control and management of invasives.

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7. Manage healthy fisheries resources and provide recreational fishing in a manner that does not detract from or limit the ability to manage the refuge for its primary purpose, which is waterfowl and other migratory birds.
- a. Establish a water management plan that meshes management of the pool for multiple purposes (including fish), where possible, but assures that water level management priorities remain focused on migratory bird management.
 - b. Deepen the borrow ditch around the outside of the pool, interior ditches, and ponds to a depth of 7 to 8 feet and a minimum of 20 feet wide to provide deeper water habitat that will support brood fish during severe drawdowns.
 - c. Work with the Louisiana Department of Wildlife and Fisheries to collect and analyze the necessary biological data to establish and maintain a healthy and adequate sport fish population.
 - d. Maximize family oriented use of the fishery resource, but limit fishing to the period from March 15 through October 15. Nesting wading birds should be protected by keeping anglers outside of a 300-foot buffer around rookeries.
 - e. Through a public education program, make the fishing users of the refuge aware that the primary purpose of the pool is for migratory birds. To lengthen the life of the pool and the benefit all fish and wildlife resources, the pool will be drawn down to mineral soil every 7 to 10 years. Fishery resources will be at least partially protected in deep ditches and pools. Fishing will be closed during these intensive management activities (USFWS 2003).

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III. Plan Development

OVERVIEW

The process for developing this plan first began in May 2002, with a Biological Review conducted by representatives of the Service and conservation partners from Louisiana State University, Louisiana Department of Wildlife and Fisheries, National Wetlands Research Center, and the Gulf Coast Joint Venture Office of the North American Waterfowl Management Plan. About 25 biologists spent a week conducting a critical review of the refuge's existing biological programs and developing a set of recommendations for future desired conditions. A comprehensive Public Use Review was held in October 2002, with reviewers representing the Service, Friends of Lacassine National Wildlife Refuge, and Louisiana Department of Wildlife and Fisheries. Their recommendations helped establish the proposed alternatives and goals, objectives, and strategies found in this document.

SCOPING MEETINGS - GENERAL

The Service invited the public to participate in a series of scoping meetings. Meetings were held in various communities in Cameron Parish in 2002 as follows: October 1, Carlyss; October 8, Grand Lake; October 10, Cameron; October 16, Hackberry; and October 17, Johnson Bayou. Approximately 25 people in total attended these meetings. On January 16 and February 4, 2003, public open house meetings were held in Lake Charles, with a total of 33 people attending. On February 6, 2003, a public meeting was held in Lafayette, with four people attending and on February 8, 2003, a meeting was held in nearby Jennings, with two people in attendance. Comment forms were placed in the Visitor Center and invitations to comment or provide input were issued at various special events.

Various issues emerged from these meetings and were considered during the preparation of the plan. In particular, many of the attendees brought up concerns about fishing on the refuge.

SPECIAL FISHING FOCUS GROUP MEETING

An intensive effort to bring together people who were interested in fishing issues at the refuge resulted in over 40 members of the public attending a Fishing Focus Group meeting in Lake Charles on September 4, 2003. Participants were given an overview of the refuge, the planning process, and then randomly assigned to smaller groups to discuss issues. Each group brainstormed, identified and prioritized issues, and then each group presented their results to the entire audience. The format of the meeting facilitated open discussion among user groups with conflicting interests, and among the public and Service staff. Results of the meeting are found in Appendix E.

SPECIAL LACASSINE POOL MANAGEMENT MEETING

More than 100 people attended a meeting on May 18, 2005, at the Lake Charles Civic Center, to discuss future management of the Lacassine Pool. Continued interest in the pool and associated issues with fishing prompted the Service to hold the meeting. The Service presented ten management proposals for the pool and invited participants to review and select their preferred solution. The majority of the participants chose the Service's preferred action plan, Proposal Number 8, which is included in the goals, objectives, and strategies of this draft plan and environmental assessment (Chapter IV).

In summary, Proposal Number 8 would subdivide the pool into 4 interconnected units (Unit D plus three additional units) approximately 5,000 acres in size, with each unit being treated on a 10- to 15-year cycle, but not simultaneously; the treatments will be staggered as follows:

- Once every 10 to 15 years, draw one unit completely down during the spring to allow for oxidation and conduct a prescribed burn to set back natural succession and dispose of accumulated dead plant material. The refuge will obtain permission to conduct prescribed burns during severe fire danger conditions.
- Use mechanized equipment wherever practicable to build fish passage ways and deep ponds so that fish will have escape routes to deeper water during droughts or cyclic drawdowns.
- Restock the fisheries resource as needed based on lessons learned from the 1999-2000 drought.
- Provide additional boat launching sites, water control structures, and water pumping devices as needed to maintain the maximum water management capability possible.
- Develop a water management plan for each unit as it is rehabilitated that benefits migratory birds, fish, and other wildlife.
- The remaining units awaiting their initial sediment treatment will continue to be open to fishing. An adaptive management strategy will be employed so that spillways will be set to hold water within the designed capabilities of the pool levee system to benefit migratory birds, fish, and other wildlife.

These actions should continue to allow for the growth of *Brasenia* (e.g., water-shield) and other beneficial water food plants, create loafing areas for waterfowl, maintain the diurnal sanctuary for wintering waterfowl, and maintain fisheries habitat.

Additionally, members of the public who participated in this meeting also supported conducting a feasibility study for plant removal. The study will focus on the removal of dead plant vegetation that has accumulated in the pool over the last 60 years by a private entity that will then sell the material as top soil or peat on the open market. Concurrently, the study should also investigate the feasibility of mechanically removing floating aquatic vegetation with the best available technology. The study will determine what the permitting requirements will be and if it can be a financially and environmentally viable project. If the project is viable, it will be implemented in conjunction with the proposed alternative.

SPECIAL HURRICANE DAMAGE MEETING

Finally, on March 9, 2006, the Service held a meeting at the Lake Charles Civic Center to discuss the devastation caused by Hurricane Rita in September 2005, and its impacts on the refuges within the Southwest Louisiana National Wildlife Refuge Complex. In part, a presentation given by the Refuge Manager to more than 100 people in attendance explained what the damages were, how the Service would address them, and when the public could use refuge facilities. A summary of the Refuge Manager's comments is as follows:

The Lacassine Refuge marshes, including Lacassine Pool, were most notably affected by the inundation of saltwater and reduced dissolved oxygen levels. In addition to the forceful surge damage throughout all of southwest Louisiana, the resulting saltwater and reduced dissolved oxygen levels have damaged plant and animal life. Many species are intolerant to the highly saline water from the Gulf of Mexico and have perished. Dissolved oxygen levels were decreased or used up by the process of decay and the mixing of silt throughout the water. Low dissolved oxygen levels are one of the most common causes of post-storm fish and crab

kills. When oxygen levels get too low, fish and other species, such as crabs and shrimp, can't get enough oxygen necessary for metabolism and they die. The Service pulled all the boards from the water control structures during December 2005 to flush out as much of the saltwater as possible.

Although rainfall has been low, water has been pushed out to the extent possible by north winds throughout the winter. This action probably saved what fish remain in the pool. The refuge appreciates the assistance of Louisiana Department of Wildlife and Fisheries and local anglers who conducted some sampling to find out what was remaining in the pool. The good news is that the anglers and a state biologist found and caught numerous bass during the February sample period, however, sunfish, crappie, and small bass were absent from the fish caught.

Despite boards being placed back in the water control structures this week, the water levels will remain low until there is significant rainfall. The pool will open for fishing March 15th, despite these low water levels. Refuge officials remind anglers that surface drive motors 25 horsepower or less are permitted. The refuge also recommends the use of a push pole to help maneuver boats through shallow spots.

ISSUES IDENTIFIED BY THE PUBLIC DURING SCOPING

Issues identified by the public included:

BOATS

- Concerns for safety while using boats in the pool.
- Require flags on all boats for safety and visibility in boat lanes.
- Need improvements and control of weeds and vegetation in boat trails.
- Open and deepen boat lanes and canals.
- Mark and widen intersections of boat lanes.
- Mark intersections instead of requiring flags on boats.
- Require tournament anglers to slow down their boats.
- Keep horsepower at 25.
- Improve access to the pool.
- Update maps showing boat trails.

FISHING

- Anglers support catch and release policy – let the bass grow.
- Catch and release only for tournament fishing.
- Enforce catch and release between March 15 and May 1 to allow fish to spawn. Take photos if big fish are caught.
- Enforce limits of 50 bream and 25 crappie.
- Against stocking non-native Florida hybrid bass.
- Support stocking native bass.
- Enforce slot and creel limits.
- Enforce a maximum limit of 1 trophy fish (22" or more) per day.
- Open refuge for fishing later in the year.
- Give anglers more days to fish.
- Spend more time and effort on improving fisheries.
- During drought, close the refuge to all fishing.

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- Some people have concerns about refuge management and have asked for restrictions that are more stringent on fishing on the refuge. We were told research did not support any changes in the way things were being done.
 - Although the first priority is waterfowl, the refuge can provide other sportsmen opportunities to enjoy other interests, such as fishing.
 - When one form of wildlife is considered more important than others, the use of the refuge should be for the enjoyment of those who do not abuse it. Economic impact of angler should be considered.
 - I have been lucky to enjoy some fishing on the refuge that most people only dream about. Although I may never be able to repeat these experiences, it is frustrating to think my daughter may never get the opportunity.
 - Not enough emphasis placed on fish.
 - Close the refuge to fishing 2 days a week (example – Tuesday and Thursday).
 - Keep the pool open 7 days a week.
 - Quality of fish has improved over the years but quantity has shown a definite decline.
 - Educate people about releasing small fish (bait sized fish are being kept).
 - Banks are too steep to fish from. Add docks for family and bank anglers.
 - Have law enforcement officers check anglers more often.
 - Build staging ponds and breeding areas for restocking fish.
 - Control vegetation. Find funding to do this.
 - Too much emphasis placed on protecting waterfowl, not enough on fish.

TOURNAMENTS

- Too many tournaments.
- Limit tournaments - 20 straight weeks on Mondays is too much; once a month is plenty.
- Allow each group to have only one tournament a year.
- Don't stop tournaments but do provide a better facility to record information on the catch.
- Make a better place to release the fish giving them a better chance to survive.
- Stop tournaments because afterwards there are dead fish near the boat launch after release.
- Hold off on tournaments until the fish recover.
- Not enough public places to fish for families and tournaments will want control of the refuge.
- Profiting from tournaments is wrong.
- Tournaments are hurting fish populations.
- Tournament anglers have helped make the pool better through providing fish for stocking, helping build pavilion and kiosk, helping keep the boat trails open, helping pick up litter.
- Allow only catch and release during tournaments.
- Allow and encourage weigh-ins at onsite at the refuge.
- Tournament anglers are not courteous.
- Tournament anglers are using motors that are too large.

HUNTING

- Hunting has become a rich man's sport and unless you have money to pay for a lease, you have nowhere else but the refuge to hunt.
- Extend the deer season such as during the duck season split or add more time to hunt on the refuge at the end of the refuge season
- Would like to see a weekend muzzleloader hunt.
- Would like to see a frogging season for a week with a limit of 20 to keep people from profiting from it.

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- Recent expansion of open areas for hunting on the refuge goes beyond the bounds of responsible game management. The area is over hunted and fosters an unsafe environment with liability issues. Enforcement problems exist such as shooting before legal hours. Mission of the refuge is being compromised because of loss of sanctuary and increase of crippled ducks by unskilled hunters.

WATER MANAGEMENT

- Raise water level in the pool to improve fish populations because there is more public use for fishing than anything else.
- Raise water level in the pool for safer travel in boats and give fish more chance to survive.
- Raise water levels in the pool to save water in case of another drought.
- There is poor water management.
- Maintain a happy medium to support both fish and waterfowl.
- Maintain a minimum “pool” level year-round. If water falls below the minimum, close the refuge to fishing until water rises above the minimum.
- Water level has been lowered repeatedly to allow for more vegetation growth and the water levels have affected oxygen supply for the fish population.
- Predetermine a drought plan.
- Have a more aggressive water management plan.
- Install better boards in the pool.
- Install non-removable boards.
- Document pool levels once a month.
- Mark low and high spots in pool.
- Raise water level a foot and it would help both ducks and fish.
- Maintenance needed on spillways.
- Maintenance needed at boat launches.

ENTRANCE/USE FEES

- Charge fees to get on the refuge and use the fees to restock fish, improve facilities, and upkeep of roads and habitat. Do not reduce federal budget that is supplemented from user fees.
- Eliminate the \$50 special use fee to hold a tournament
- Allow anglers to conduct fundraisers and donate the money for refuge improvements.

GENERAL

- Want to thank state and federal government for purchasing and maintaining the refuges. Without these efforts, there would be no place to bring our kids and grandkids in the future.
- Littering is a major problem because there are no containers to throw trash in.
- Ban alcohol from the refuge.
- Anglers would like to organize a support group for the refuge.

ISSUES IDENTIFIED DURING INTERNAL SCOPING AND THE BIOLOGICAL AND PUBLIC USE REVIEWS

Issues identified during internal scoping (i.e., among Service professionals and refuge managers and biologists) and the biological and public use reviews can be divided into the three general topics of habitat, wildlife, and people.

HABITAT

- Maintaining the integrity of Lacassine Pool as a freshwater marsh.
- Monitoring and mapping vegetation, vegetative communities, soils, water depth, depth of organic layer in the pool.
- Repair, recondition, or replace the three major water control structures in the pool to facilitate water management.
- Ensuring a complex of habitat types for ducks, geese, and shorebirds.
- Ability to intensively manage early successional wetland units and croplands.
- Restoring and managing native coastal prairie habitats on public and private lands.
- Increase habitat monitoring at very fine scales.
- Implementation of an inventory and monitoring plan that utilizes scientifically sound biological inventory procedures.
- Control of exotic plants and animals, especially Chinese tallow.
- Balancing recreational fishing and wintering waterfowl habitats on Lacassine Pool.
- Deepening the borrow ditch around the perimeter of the pool to increase height of levee and provide greater water depth.
- Fire management/monitoring/cycles/effects.
- Water quality monitoring.
- Oil/gas and other contaminants.
- Managing and minimizing habitat effects oil and gas exploration and development.
- Land acquisition.
- Conserving bottomland hardwood habitat (e.g., cypress-tupelo swamp).
- Improving habitat along levees.
- Major equipment needs used in habitat management and manipulation (e.g., early successional wetlands, croplands, and repairing or raising levees around Lacassine Pool).

WILDLIFE

- Fulfilling the refuge's primary purpose as a sanctuary for migratory birds, including geese, ducks and shorebirds.
- Providing for the year-round needs of mottled ducks.
- Continuing to furnish nest boxes for cavity-nesting ducks.
- Herpetological (e.g., reptiles and amphibians) survey and monitoring.
- Alligator management and trapping.
- Furbearer trapping.
- Fisheries management including fish disease and paddlefish.
- Songbirds, both resident and neotropical migratory birds.
- Protecting nesting colonies of colonial nesting birds.
- Protecting bald eagles and other threatened and endangered species that may occur on the refuge.
- Research and special needs.
- Adaptive management.

PEOPLE

- Proposed visitor center location.
- Improvement of signage.
- Location/modification of public uses (e.g., hunting and fishing).
- Coordinating waterfowl hunting season and weekly schedules with other refuges in Southwest Louisiana Refuge Complex.
- Expansion of deer hunting opportunities.

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- Small game hunting – whether and when and where to allow.
 - Management of recreational fishery, including perceptions and reality of conflict with waterfowl purpose of refuge and competition between different user groups (e.g., tournaments vs. family fishing).
 - Expanding environmental education and interpretation on the refuge.
 - Managing and increasing opportunities for wildlife observation and wildlife photography on the refuge.

CULTURAL RESOURCES

In addition to the above issues identified by the public and the Biological and Public Use reviews, the Service identifies the protection and preservation of its cultural resources as an important issue.

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IV. Management Direction

INTRODUCTION

On national wildlife refuges, the Service manages fish and wildlife habitats by taking into account the needs of all resources in decision-making. First and foremost, however, fish and wildlife conservation assumes priority in refuge management. The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. §668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997, clearly establishes that wildlife conservation for the benefit of present and future generations of Americans is the singular National Wildlife Refuge System mission. House Report 105-106 accompanying the National Wildlife Refuge System Improvement Act of 1997 states "...the fundamental mission of our System is wildlife conservation: wildlife and wildlife conservation must come first."

However, the Improvement Act also recognizes that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, when determined to be compatible, are legitimate and appropriate public uses of the Refuge System and that these compatible wildlife-dependent recreational uses are the priority general public uses of the Refuge System.

Another requirement of the Improvement Act is for the Service to maintain the ecological health, diversity, and integrity of refuges. National wildlife refuges in the Chenier Plain of the Gulf Coast include both brackish and freshwater marshes, in addition to coastal prairies, agricultural areas, and some woodlands and swamps. Valuable coastal marshes in the region have declined tremendously in quantity and quality over the past century, due to both human and natural causes. To offset these historic and continuing habitat losses within the broader coastal ecosystem, Lacassine National Wildlife Refuge and other public lands provide a biological "safety-net" for migratory waterfowl and non-game birds, threatened and endangered species, and resident species. However, as noted previously in this document, the primary purpose of the refuge and Lacassine Pool is to sustain high-quality habitats necessary for migratory birds, in particular waterfowl, and fulfilling this purpose has the highest priority.

VISION

Lacassine National Wildlife Refuge will continue to be a haven for the protection and management of migratory birds, especially waterfowl, in a region of the continent that is critically important for their survival. Working with partners, the refuge will protect the habitats of wildlife and fish, focusing on conserving the integrity of the vanishing freshwater marshes of the Chenier Plain. Lacassine Refuge will improve existing opportunities for visitors to use and enjoy its unique biological resources in a way that does not compromise their value and that increases awareness of their importance.

GOALS, OBJECTIVES, AND STRATEGIES

The goals, objectives, and strategies addressed below are the Service's response to the issues, concerns, and needs expressed by the planning team, refuge staff, and public. These goals, objectives, and strategies reflect the Service's commitment to achieve the mandates of the National Wildlife Refuge System Improvement Act of 1997, the mission of the National Wildlife Refuge System, the North American Waterfowl Management Plan, and other special purpose management plans, and the purpose and vision of the Lacassine National Wildlife Refuge. The refuge is an

extremely important area for migratory birds, especially waterfowl, and the goals, objectives, and strategies found below support this purpose.

In addition, implementation of the goals, objectives, and strategies would help maintain and restore, where appropriate, the biological integrity, diversity, and environmental health of the refuge. The refuge would also contribute to the biological integrity, diversity, and environmental health at larger landscape scales (e.g., regional, ecosystem, and national levels). Examples of the refuge's commitment to the principles of biological integrity, diversity, and environmental health are protecting and restoring unimpounded marsh, bottomland hardwoods, and native coastal prairie; simulating hydrological processes for habitat restoration; and providing habitat for endemic species, such as mottled ducks.

The refuge staff intends to accomplish these goals, objectives, and strategies over the next 15 years.

GOAL A: HABITAT MANAGEMENT - Conserve, restore, and enhance diverse habitats to provide favorable conditions for migratory birds and native terrestrial and aquatic species.

Objective A-1: Management of Impounded Freshwater Marsh (Lacassine Pool) - Manage the pool to achieve a habitat mosaic in an approximate emergent vegetation to open water ratio of 50:50, with plants of high waterfowl food value and extensive beds of submerged aquatic vegetation, so as to provide roosting and foraging habitat and sanctuary from disturbance for migratory birds, fish, and other wildlife compatible with the purposes of the refuge.

Discussion: The Lacassine Pool was created in 1943 by enclosing a 16,000-acre marsh with a low levee. The pool is filled by rainfall only (i.e., no inflows) and lowered by removing stoplogs at its several water control structures. This impoundment serves as a daytime sanctuary for waterfowl.

Proper management and enhancement of the pool for waterfowl and other aquatic birds are the original purposes of the refuge and its highest priorities. The primary emphasis of pool management must be on aquatic birds and their habitats, followed by compatible public uses that do not detract from the critical role of this unit for waterfowl and other wetland-dependent birds. At times, needed management options involving drawdowns may conflict with public uses under this alternative.

The participants in a public meeting held in Lake Charles on May 18, 2005 (described in Chapter III and Appendix E), demonstrated strong support for subdividing the pool into more manageable components. The Service intends to proceed with this proposal when available resources are approved.

On September 24, 2005, Hurricane Rita struck southeast Louisiana with 121 mile-per-hour winds and a storm surge ranging from 15 to 20 feet. The storm surge topped the Lacassine Pool dikes and water control structures carrying saltwater into the pool and killing vegetation, some fish, and other aquatic organisms. Salinity in the pool ranged from 14 ppt to 1.2 ppt during the period September 24, 2005 - March 6, 2006. Fish sampling conducted by the Fish and Wildlife Service and Louisiana Department of Wildlife and Fisheries indicated that some bass and bowfin were still present, however, no sunfish or crappie were in the samples collected. Sampling was done by gill net and angling.

The restoration of the pool will be a very high priority in the future so it can continue to fulfill the needs of wintering migratory birds and serve as an excellent area for wildlife-dependent public use, such as fishing. A project for this restoration is discussed in Chapter V of this plan.

Strategies:

- (a) Continue repairing and maintaining all spillways and leaking levees.
- (b) Operate the spillway structures to accommodate a pool level that benefits migratory birds and takes into consideration fish, other wildlife, and access for recreational fishing.
- (c) Conduct prescribed/hazardous fuel removal burns as environmental factors permit. Secure advanced permission from appropriate decision-makers to conduct prescribed burns during severe fire danger periods.
- (d) Pool elevations would be surveyed to allow for subsidence and the resetting of spillway structure gages and stop logs.
- (e) Rehabilitate and maintain a deepwater perimeter ditch around the interior perimeter of the pool.
- (f) Continue to stock fish as needed and continue to collect fisheries and waterfowl use data.
- (g) Subdivide the pool into three additional management units (Unit D, plus three additional units). The first phase would be accomplished by separating the southeast 5,000-acre-unit and replacing the two existing water passageways with two new water control structures with boat passage gates, the placement of a mobile water pumping unit, and the removal of any interconnecting culverts so that the unit would have the capability to be fully isolated from the remaining 11,000-acre-unit while it is being restored. The southeast unit would be treated in accordance with strategies identified in Objective A-1. The next phase, installation of an additional dike across the remaining 11,000-acre-unit with associated infrastructure, would occur as soon as resources are available. While the first phase is being completed, the remaining 11,000-acre-unit would be managed using the strategies identified in Objective A-1.

Studies

Concurrently with the preceding actions, the Service would:

- (h) Conduct a feasibility study focused on the removal of dead plant vegetation that has accumulated over the last 60 years. A private entity would remove the material and sell it as top soil or peat on the open market. The study should also investigate the feasibility of mechanically removing floating aquatic vegetation with the best available technology. The study would determine what the permitting requirements would be and if it could be a financially and environmentally viable project. If the project proved viable, it would be implemented.

Treatment of individual management units once constructed

Each unit would be treated using the following strategies:

- (1) Within a 10-year period, but not to exceed 15 years, draw one unit completely down during the spring to allow for oxidation and conduct a prescribed burn to set back natural succession and dispose of accumulated dead plant material. Continue fuel reduction material burns as needed but conduct burns during the summer months whenever possible. Drawdown of the unit may require multiple years to achieve management goals.

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- (2) Obtain advance permission to conduct prescribed burns during severe fire danger conditions. Keep annual records of fire practices and have prescription plans prepared to take advantage of drought periods.
 - (3) Provide water control structures and water pumping devices as needed to maintain the maximum water management capability possible.
 - (4) Develop an adaptive water management plan for each unit as it is rehabilitated that benefits migratory birds and takes into consideration fish, other wildlife, and recreational fishing. The plan should include:
 - Development and maintenance of an elevation profile throughout the pool to determine depths to mineral soil, depth of organic matter, and pool contours.
 - Installation of water level gauges at strategic points in the pool to allow recording of pool water elevations and drawdown schedules.
 - Review of the water quality sampling plan to re-establish sampling objectives and procedures that would be sensitive to significant changes (i.e., immediate or long-term) inside and outside the pool.
 - Acquisition and updating of aerial imagery, ground surveys, and sound sampling procedures to track vegetation communities and open water/vegetation ratios and trends at 5-8 year intervals (work with U.S. Geological Survey to type map pool vegetation communities and repeat every 5-8 years).
 - Monitor changes in the pool by utilizing fine-scale plant/habitat aerial imagery inventory methods to type map habitats, with an emphasis on identifying aquatic-plant types, ratios of open water to vegetation coverage, and comparisons of vegetation/water ratio trends over a 5-year time period.
 - Determine vegetation/water ratio changes associated with years following major hurricane events and any introduction of higher salinity waters.
 - (5) The remaining units awaiting their initial sediment treatment would continue to be open to fishing. Water levels would continue to be managed in a manner that is conducive to migratory birds, and, to the extent possible, a fisheries resource and recreational fishing.
 - (6) Inform the public through refuge brochures (e.g., hunting and fishing) and at kiosks that the primary purpose of the refuge is migratory bird management. The message should state that measures taken to improve migratory bird habitat are also expected to benefit fish populations and anglers by prolonging the life of the pool.
 - (7) Archive all previous and future management treatments and scientific/biological studies, data relating to management actions/results, vegetation maps, impacts of catastrophic events (e.g., hurricanes and droughts) in one file or binder for future reference.
 - (8) Continue the historical waterfowl sanctuary status of the pool for migratory birds, especially waterfowl, and limit human disturbances by restricting and closely regulating public use of the

pool itself and its observation route from October through March; by controlling oil and gas exploration and development; and by locating and protecting rookeries.

(9) Use mechanized equipment wherever practicable to build fish passageways and deep ponds so that fish would have escape routes to deeper water during droughts or cyclic drawdowns.

(10) Restock the fisheries resource as needed.

(11) Provide additional boat launching sites.

Unit D management

(i) Keep the 714-acre Unit D, established as an experimental research unit, separated from the pool.

(1) Work with the Louisiana Department of Wildlife and Fisheries and Fish and Wildlife Service fisheries biologists to manage the area as a special waterfowl and fisheries management area.

(2) Explore the feasibility of imposing special fishing regulations in Unit D that may favor longer-living centrarchids and, if practicable, implement the initiative.

(3) Explore providing some form of limited horsepower boating access to the area under a time and space management program. If it is determined that this is feasible, implement the access.

(4) Habitat management of this individual unit would follow the same general management guidelines as identified for the pool units, with options to implement experimental treatments that might be applicable for improving management of the rest of the pool.

Gulf Intracoastal Waterway

(j) Closely monitor and document the effects of shipping traffic on the south dike of the Lacassine Pool, which is adjacent to the Gulf Intracoastal Waterway.

(k) Implement an engineering study within five years to determine what preventive action needs to be taken to avoid erosion potentially being caused by vessels using the Gulf Intracoastal Waterway.

Objective A-2: Unimpounded Freshwater Marsh - By 2015, reestablish the shoreline of Willow Cutoff to improve water quality, eliminate further erosion, and restore natural marsh conditions.

Discussion: The marshes adjacent to Lacassine Bayou were converted to shallow open water presumably because of the increase in water levels following construction of the locks on the Gulf Intracoastal Waterway and the Mermentau River. Restoring wetlands would improve water quality (i.e., reduce nutrient and sediment concentrations) in water flowing down Lacassine Bayou, and improve habitat quality for migratory birds, fish, and other wildlife.

Marsh creation via dedicated dredging would restore emergent vegetation but the cost is assumed to be prohibitive. Marsh terraces may be a more viable restoration technique for this area because of the shallowness of the water; the large expanse of open water; the likely shallowness of firm clay that could be excavated to create the terraces; the value of the deep water in the borrow pits for fish and waterfowl; the absence of salinity that would stress emergent vegetation; and the possibility of

improving growth of submersed aquatic vegetation in the open water areas remaining after terrace construction.

Strategy:

- (a) By 2017, prepare a feasibility study and, if appropriate, a restoration plan for the marshes adjacent to Lacassine Bayou based on hydrologic modeling and possibly using terraces as a means to improve water quality and either restore marsh or submersed aquatics. Consider carrying out this project as a mitigation project.

Objective A-3: Early Successional Wetlands - Establish adaptive management capabilities on up to 750 acres in Units A, C, and possibly E to provide shallow water and emergent wetland plant species for waterfowl, shorebirds, secretive marsh birds, and wading birds.

Discussion: Adaptive management is a system used to improve results by documenting management actions, measuring and documenting biological response, and adapting (i.e., modifying) management actions to improve desired conditions/outcome.

Water levels within early successional wetlands, often called moist-soil units by the Service, are manipulated seasonally for two main reasons. First, different groups of birds have different feeding requirements. Dabbling ducks prefer enough water to swim easily but shallow enough to allow bottom feeding. Shorebirds concentrate on mud flats or very shallow water where invertebrates can be readily found. Wading birds, such as herons and egrets, also utilize deeper borrow ditches and shallow water areas.

Currently, at Lacassine Refuge, 307 acres are managed as early successional wetland habitat in Unit A. In Unit C, farming was discontinued in 1981. In 1993, the refuge planted rice in the western portion of the unit and began managing it as a moist-soil unit.

Strategies:

- (a) Early successional wetlands would be maintained in early successional native plant communities for the production of annual seed crops.
- (b) Provide early successional wetlands from mid-August through October for early migrating waterfowl and shorebirds.
- (c) Provide early successional wetland habitat from November through March for wintering waterfowl.
- (d) In Unit A, develop a system of pumps and water control structures to intensively manage at least 4 fields annually to maximize production of native plants recognized as preferred waterfowl food. Use various management tools, including manipulating water levels and soil moisture, discing, burning, mowing, water buffaloing, and selective herbicide application.
- (e) In Unit C, re-establish water management capability and improve and recondition much of this unit, except the rookery area, in an effort to develop high-quality, early successional wetland habitat on at least 300 acres by improving water management capabilities (e.g., improved structures and pumps). Promote high seed-producing annual plants using various management tools.

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- (f) Consider further subdividing Unit C to achieve the capabilities needed to successfully manage early successional wetland plants.
 - (g) Plan, monitor, and document plant and wildlife responses to early successional wetland management actions by unit utilizing standardized techniques and refuge-wide sampling techniques.
 - (h) Install water level gauges on all early successional wetlands (e.g., moist-soil units).
 - (i) Manage for early successional wetland plants in Unit E.

Objective A-4: Coastal Prairie - Work with partners to maintain and restore approximately 1,000 acres of coastal prairie habitat and conserve prairie plant seed sources at the Duralde Prairie (also called Vidrine Tract) and other sites for the benefit of grassland birds and to contribute to the priorities of the Texas Gulf Coast Ecosystem and the Lower Mississippi River Ecosystem.

Discussion: The coastal prairie is a tallgrass prairie ecosystem that once encompassed an estimated 3.5 million ha (8.6 million acres). Today only a tiny fraction remains. This critically endangered ecosystem is becoming a high priority for the Service. Like Midwestern prairies, the coastal prairie is dominated by grasses, such as little bluestem, switchgrass, indiagrass, and big bluestem, with over 500 species of grasses, sedges, and wildflowers. However, coastal prairie is distinct in several ways, including the presence of species that are not found in the midwestern prairies.

Grassland birds have exhibited a sharper decline in tallgrass prairie during the past 25 years than any other group of North American birds. In Louisiana, old fields and pastures that once provided grassland bird habitat are being replaced with forests of the exotic, invasive Chinese tallow tree. Some of the many species of concern include the Henslow's (*Ammodramus henslowi*), grasshopper (*Ammodramus savannarum*), savannah (*Passerculus sandwichensis*), and Le Conte's (*Ammodramus leconteii*) sparrows; eastern meadowlark (*Sturnella magna*); loggerhead shrike (*Lanius ludovicianus*); dickcissel (*Spiza americana*); yellow (*Coturnicops noveboracensis*) and black (*Laterallus jamaicensis*) rails; bobolink (*Dolichonyx oryzivorus*); short-eared owl (*Asio flammeus*); and the northern harrier (*Circus cyaneus*).

Strategies:

- (a) Use management tools, such as fire, mowing, transplanting, overseeding and postseeding, introduction of additional plant species, and selective herbicide application, to accomplish this objective. Mowing or haying (i.e., where clippings are removed) may be used in areas where fire is not an option.
- (b) Work with partners to establish a long-term monitoring plan using standardized protocol(s) (e.g., Project Prairie Bird) to measure grassland bird use and adapt management to achieve high-quality prairie habitat.
- (c) Make several small prairie plantings, each from a different prairie remnant and each isolated genetically from one another (i.e., at least one mile between sites), to serve as diverse seed sources.
- (d) Restore additional coastal prairie, ideally in blocks of one to several hundred acres to support winter grassland birds and, ultimately, one large block of 10,000 acres, assuming that propagules

and operation and maintenance support are available when needed to provide habitat for area-sensitive species.

Objective A-5: Croplands - Maintain approximately 550 acres in Units B and F annually in cooperatively farmed crops, such as rice, soybeans, and winter wheat, to provide foraging opportunities for wintering waterfowl.

Discussion: Unit B is a 724-acre area, which includes 579 acres of rice impoundments that have been managed since 1990 by a cooperative farmer. Rice is planted in a field every other year, alternating with wheat, rye grass, or fallow. The farmer harvests the first crop of rice and leaves the second crop for waterfowl, which works out to be about 20-25 percent of the total rice crop. Wheat or rye is planted as green browse for wintering geese.

The refuge acquired the 530-acre Unit F in 1996; since then, it has been cooperatively farmed similar to Unit B. On average, 327 acres of rice are planted in a field every other year, alternating with wheat, ryegrass, or fallow.

Overall, the objective should be to provide a minimum of 3.4 million MUD's of wintering waterfowl foraging habitat annually from second crop rice and 200 to 300 acres of shorebird habitat on fallow fields.

Strategies:

- (a) Maintain the current farm agreement, which requires the farmer to leave the second crop unharvested, providing a large volume of quality food for wintering waterfowl.
- (b) Management of fallow rice fields should be modified to provide improved foraging habitat for wintering waterfowl by allowing seed maturation of weeds before discing.
- (c) When managing fallow cropland for shorebirds, alter drawdown schedules to provide shallow water/mudflats from late-March until early-May and from mid-August through October. Work with cooperative farmers to limit discing from August 1 through September 30, and to provide water depth suitable for shorebird use.
- (d) As a part of the normal manipulation of early successional wetlands (e.g., moist-soil habitat) in Unit A, the refuge should annually produce about 70 acres of rice, or other grain, that would be left for wintering waterfowl.
- (e) If cooperative farming is lost as an available management option, contract farming or force account farming should always be considered on a minimum of 300 acres of rice production.
- (f) If current farm practices in southwest Louisiana cause significant reductions in wintering waterfowl foraging habitat capacities on private lands (e.g., a significant reduction in the rice acreage), the refuge should work to offset those losses through a private lands program and increased crop production on the refuge.
- (g) Continue farming practices, including cooperative farming, as tools to maintain farm units in a condition free of Chinese tallow.
- (h) By 2016, update the cooperative farming step-down plan.

Objective A-6: Artificial Uplands - Increase maintenance, mowing, and spraying of 26 miles of levees to discourage Chinese tallow invasion, maintain structural integrity, and reduce depredation on resident nesting waterfowl and other migratory birds. Rework 8-10 miles of levees on Units B and C by 2014, and rehabilitate 5-7 miles of south levee and west levee at Lacassine Pool by 2014.

Discussion: Levees are important at the refuge because 1) they are essential to maintaining the aquatic and wetland habitats associated with Lacassine Pool and moist-soil units and, 2) they comprise rare upland habitat in their own right. Thus, the refuge must maintain its structural and functional integrity to ensure the conservation of moist-soil units and Lacassine Pool, and it must control invasive plant species and depredation on nesting birds. Resident nesting waterfowl and certain other birds utilize the levees for nesting, where they are vulnerable to depredation by opossums, raccoons, and coyotes, among other predators.

Strategies:

- (a) Annually survey levees for both structural integrity and infestation by exotics or invasive plant species to determine maintenance priorities for that year.
- (b) Monitor population trends of predators to see if temporary predator control trapping is advisable to protect nesting birds.
- (c) Use a combination of fire, herbicides, and mechanical control to confront and reverse infestation by invasive plant species.

Objective A-7: Bottomland Hardwoods/Swamps - Protect and restore existing bottomland hardwood swamp habitat on the refuge, specifically cypress-tupelo stands in Upper Lacassine Bayou, Brown Island, Blue and Black Groves within Lacassine Pool, Lacassine Point, the Headquarters Pond, and the mature live oaks in the refuge headquarters area.

Discussion: Limited bottomland hardwood forest (approximately 400 acres) occurs on the refuge, primarily in the riparian areas along the Mermentau River and Lacassine Bayou. There may be opportunities for forest restoration on the existing refuge, and for acquisition of additional bottomland hardwood forests within the refuge's acquisition boundary. Analysis of weather radar imagery shows that the Mermentau River is an important migration corridor for neotropical migratory birds. Protection of forested corridors is thought to provide essential foraging and resting habitat for migratory land birds.

Strategies:

- (a) Control Chinese tallow tree and other nuisance exotic plant species where they occur.
- (b) Investigate opportunities to restore bottomland hardwood acreage along the Mermentau River and Lacassine Bayou.
- (c) Protect existing cypress groves inside and outside of the pool; investigate opportunities to regenerate cypress within the groves.
- (d) Work with oil companies to avoid damage from seismic surveys; be vigilant that oil and gas exploration can cause permanent impacts to vegetation.

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- (e) Plant cypress seedlings and other species and protect them with guards from depredation by nutria, rabbits, and deer.
 - (f) Continue to document and protect the large live oak trees located in the vicinity of the refuge headquarters and staff housing.

Objective A-8: Wilderness Area - Continue to monitor habitat changes in the Wilderness Area, conduct prescribed fire every 3-4 years, and investigate options for managing invasive plants and restoring hydrology to ponds.

Discussion: A tract of about 3,300 acres south of the Gulf Intracoastal Waterway is formally designated by Congress as Wilderness, and protected by the provisions of the 1964 Wilderness Act, which prevents any change to its wild, untrammeled character.

Since its establishment in the late 1970s, waterfowl habitat values have deteriorated in the Wilderness Area. Since no motorized boat traffic is permitted, boat trails through the vegetation have gradually closed in, restricting outflow of water from small ponds in the Wilderness Area, which have also filled in. In addition, invasive plant species have proliferated largely unchecked in the Wilderness Area.

Strategies:

- (a) Conduct aerial surveys at least once every two years to visually monitor and record habitat changes and migratory bird presence within the Wilderness Area.
- (b) Experiment with growing season fires that are expected to be more effective in controlling or reducing the encroachment of exotic species and undesirable species.
- (c) Fall burning should also be considered on an experimental basis to determine if fall burns would increase or decrease waterfowl use.
- (d) By 2014, update the wilderness management plan.

Objective A-9: Fire Management - Use fire as a multipurpose management tool to reduce hazardous fuels and promote habitat diversity. Utilize prescribed fire on approximately 10,000 acres per year.

Discussion: Fire can be a cost-effective and ecologically sound tool in pursuit of management objectives, but, if used incorrectly or without consideration, can be dangerous and costly to property and even human life. A good fire management plan provides information to the fire manager on the purpose, use, and implementation of fire, as well as contingency plans, if and when, fire suppression is needed. The fire management plan describes what management objectives are to be accomplished with the use of fire.

Management objectives for prescribed fire use at Lacassine Refuge include: 1) reducing hazard fuel, 2) controlling exotic species, 3) increasing production of waterfowl food plants, 4) increasing availability of "food" (e.g., vigorously growing plants that are normally selected species-specific by wildlife; for dabbling ducks, preferred food items within 12-18 inches of the water surface), and 5) minimizing the organic accumulation in the pool. Lacassine Refuge's fire management plan is currently under revision by the Regional Fire Management Team, as part of a 5-year review cycle.

Comments and recommendations from this review would be incorporated into the updated fire management plan for the refuge.

Prescribed fire is used at Lacassine on a 3-year burn interval for marsh habitats, as well as an annual burn cycle in prairie habitats to promote native species. In 2003, five or six prescribed fires burned 7,000 to 8,000 acres of the refuge. One management objective should be to reduce maidencane to an acceptable percentage of the landscape rather than eliminate it altogether.

Fire is an integral part of coastal prairie habitats. This fire-maintained grassland community is held in a mid-successional stage by fire, which prevents trees from becoming established.

Fire and the Lacassine Pool

Being a closed system and with management keeping water depth at a relatively constant level within the Lacassine Pool for over a 60-year period, dead plant material has accumulated within the pool and the organic layer has not been allowed to compact and naturally oxidize. Grasses have thrived, open water areas have shrunk, and woody vegetation has become established within the pool's interior. If this eutrophication of the unit continues without management intervention, the entire area will fill in, be taken over by undesirable plants, and convert to an upland habitat type. The utilization of the area by migratory birds would consequently continue to diminish with lessening open-water areas. In addition, the excellent recreational fisheries resource currently enjoyed by the American public would be lost to both them and all future generations. The American public has expressed their concerns on the future access and management within this area. Refuge records note similar concern for the health of the pool as far back as the 1953 Annual Narrative.

In 1993, the refuge staff attempted to correct the problem within the pool by raising the water level by approximately 1 to 1.5 feet. The hypothesis was that higher water would drown the unwanted vegetation. However, even after this management action occurred, vegetation continued to quickly overgrow the pool and clog the boat passageways. After more than a 10-year period, the loss of open-water areas has continued and it now appears that the higher water level may have aggravated the problem by increasing the number of pop-ups. Pop-ups are floating mats of organic debris that dislodge from pond bottoms, rise to the water surface, and become colonized by emergent vegetation. The elevated water level also placed excessive pressure on the dikes designed to hold water at a lower elevation.

David Fruge (1974) provided insight into why the pool's design has everything to do with this problem. He reported that the three small, elevated spillways allow a negligible amount of the tremendous annual crop of plant matter to escape from the impoundment. The resultant accumulation of this detritus therefore would cause aggradations of the substrate with consequent lowering of water levels, and continuing emergence of pop-ups, with resultant colonization by emergent species and consequent elimination of open-water areas and the associated floating-leafed submergent community.

Robert Chabreck (1997) experimented with dewatering and prescribed fire within a small subsection of the pool. In 1987, a 700-acre area of Unit G was partitioned to form Unit D. Within this new unit, dewatering occurred during a period from 1990 through 1992, and portions of the area was prescribed burned during 1990, 1991, and 1993; up to 1 foot of the substrate was dried by late summer 1990. From 1990 to 1997, a 64 percent decrease in the thickness of the organic layer was recorded. The vegetative characteristics of Unit D also changed during this period. Prior to the study, maidencane occurred in 90 percent of the sample plots, bulltongue in 70 percent of the plots, and the aquatic plant coontail (*Ceratophyllum demersum*) was in 20 percent of the plots. By 1997, maidencane (*Panicum hemitomon*) was present in only 70 percent of the plots, bulltongue was

completely absent, and coontail was in 80 percent of the plots. The 1994 mean elevation for the organic level in Unit G (pool) was 11 cm greater than in Unit D. Currently, open water continues to cover 70 percent of Unit D, while covering 40 percent of the pool.

During 2002, a Wildlife and Habitat Review was completed. This team of biologists, managers, foresters, and non-Service managers/biologists evaluated current management practices and provided recommendations about future habitat and water management (USFWS 2003). The team recommended the continued management of the pool as a freshwater impoundment with the primary focus on waterfowl and aquatic birds. Dewatering and prescribed fire, along with chemical control of vegetation, were recommended for reaching a suggested 50:50 ratio of open water to vegetation mix.

For management to begin addressing the lingering problems associated with the Lacassine Pool, the first step would be to eliminate the yearly accretion rates and address surface fuel reduction through the removal of growing plant materials prior to November of each year. Prescribed fire is a readily available management tool that can be used to produce the needed results. Once the elevation of the organic layer is stabilized, more drastic management actions would need to take place to gain the recommend open water to vegetation ratio. As demonstrated within Unit D, the combination of dewatering and prescribed fire can effectively achieve this end. Prescribed fire has been a consistent tool to elevate heavy fuel accumulation and to aid in setting back natural succession. When applied under the appropriate environmental factors, fire, both with and without dewatering, should work to help control accretion. For fire to have the best and most effective impact on the Lacassine Pool, burning operations must be performed during summer months and after dewatering; past prescribed fires occurred primarily during the winter months and at periods of high water. A draft fire prescription for the Lacassine Pool is being written.

Strategies:

- (a) Implement subdividing the pool to create a more manageable wetland.
- (b) Update burn plans and fire management plan to include organic matter consumption burns (i.e., ground fires in drier conditions) to meet waterfowl habitat management needs of pool.
- (c) Rework canals along pool to provide a means of water for fire suppression purposes.
- (d) Burn management units in different years to lessen impacts on insects and birds.
- (e) Reduce hazardous fuels and the potential for uncontrollable wildfires using prescribed fire, mechanical, or chemical treatments to protect life, property, industrial oil and gas infrastructure, and natural resources on the refuge.
- (f) Wildfires would be addressed in the fire management plan in such a manner as to complement habitat management on the refuge.
- (g) Prescribed fires to address hazardous material spills to minimize damage to the environment would be addressed in the fire management plan and prescription.
- (h) Hire six additional fire staff and provide support equipment, office space, and bunkhouse space to support fire management activities for refuges within the Southwest Louisiana National Wildlife Refuge Complex.

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- (i) Complete a draft fire prescription for the Lacassine Pool by the year 2007 for moderate and severe fire conditions. Ensure that appropriate National Environmental Policy Act documentation occurs.

Objective A-10: Undesirable Plants and Animals - Reduce to lowest practical level all undesirable plants and animals on the refuge to minimize negative effects on native flora and fauna.

Discussion: Non-native plant invasions are rapidly spreading across the nation into croplands, rangelands, pastures, forests, wetlands, waterways, wilderness areas, parks, refuges, and highway rights-of-way. They are causing billions of dollars worth of damage to the natural, managed, and agricultural ecosystems. Non-native invasive species have been identified as the second leading cause of biodiversity loss in the United States. Invasive noxious plants are an issue in all habitats present on the refuge and should be treated individually by habitat. Some indigenous plants, such as phragmites (*Phragmites communis*) and alligator weed, are included in these strategies because they are not desirable for management purposes.

Strategies:

- (a) By 2009, hold a training class to acquaint all refuge personnel with identification of current and potential weeds and develop literature that is brief and clear about potential pest problems for refuge visitors.
- (b) By 2013, develop an invasive and nuisance species plan recommending methods such as pesticides, mechanical removal, trapping, and fire to control cogongrass, giant salvinia, water hyacinth, phragmites, and alligator weed (indigenous, but undesirable), nutria, feral hogs, and feral cats.
- (c) Burn to control Chinese tallow. Continue to use herbicides and mechanical methods to control Chinese tallow but restrict its application to injection or bark spray in sensitive areas, such as rookeries.
- (d) Maintain alligator hunting as an activity requiring a permit to remove nuisance alligators from the refuge as deemed necessary to benefit native habitats and other wildlife, and to provide for the safety of visitors.

GOAL B: FISH AND WILDLIFE MANAGEMENT - Maintain healthy and viable wildlife and fish populations on the refuge to contribute to the purpose for which it was established and to the mission of the National Wildlife Refuge System.

Objective B-1: Fisheries - In cooperation with the Louisiana Department of Wildlife and Fisheries and other partners, manage habitat consistent with the purposes of the refuge, and monitor and seek ways to improve water quality and fishery resources to benefit migratory birds, fish, and other wildlife.

Discussion: The National Wildlife Refuge System Improvement Act of 1997 recognizes fishing as one of the six priority public uses of the Refuge System. The Act also clearly indicates that, if a conflict exists between the purpose of the refuge and the mission of the Refuge System or other management objectives, the conflict shall be resolved to first protect the purpose of the refuge, and, to the extent practicable, accomplish the mission of the Refuge System. The executive order and congressional actions authorizing establishment and expansion of Lacassine National Wildlife Refuge clearly identify its purpose as managing and protecting migratory birds and other wildlife.

Lacassine Pool supports a most important fishery on the refuge. Sampling reports over the decades indicate good-to-fair fish populations, which periodically suffer the negative effects of drought. Recommendations over the years include holding water levels as high as possible and reducing the several-decade accumulation of organics by dewatering, drying, and possible burning of this bottom material, which cannot be flushed from the impounded pool.

In the late 1980s, a 700-acre sub-impoundment called Unit D was created at the north end of the pool to test the idea of dividing it into smaller, more manageable units. Although the drying/burning process was not completed before rains returned, the results showed promise in providing greater water depth and in eliminating maidencane, a widespread aquatic plant of low value to waterfowl but beneficial for alligator nesting. The perimeter levee was also raised, resulting in a higher water level and deeper water, a better fishery, and increased popularity of fishing, including tournaments. Another idea for the creation of deeper water habitats involves the deepening of existing canals, which could provide access for anglers and refugia for fish during low-water conditions.

However, accumulated organics and inadequate depth continue to be problematic, reducing the wildlife value of the pool, especially to fish in times of drought. Most recently, the severe drought(s) of the late 1990s and early 2000s essentially dewatered the pool, a benefit to longevity of it and subsequent fall/winter waterfowl populations but detrimental to fish and fishing.

Some conflicts are inevitable between waterfowl and fishing programs due to differing water level requirements. However, as noted at the outset, the primary purpose of the refuge and Lacassine Pool is to sustain high-quality habitats necessary for migratory birds, in particular waterfowl, and fulfilling this purpose has the highest priority. Nevertheless, expert opinion holds that pool management for fish/fishing and waterfowl can be compatible for at least 7 to 8 of every 10 years. However, if the pool is subdivided, the problem would not occur. The key objectives for maintenance and longevity of the pool are to maintain a palustrine emergent/aquatic system as a high-quality waterfowl sanctuary/foraging area that would require drawdowns and possible prescribed fire to control vegetation to open water ratios and excessive buildup of organic matter. Critical to the accomplishment of these objectives is the ability to replace, maintain, and operate three key water control structures. However, as a result of the public meeting held in Lake Charles, Louisiana, and the proposed corrective actions that would be taken to enact management of the pool, fishing should be available to anglers on an annual basis without interruption. An exception to this would be if a hurricane resulted in significant saltwater intrusion. If this occurred, a drastic measure, such as a long-term drawdown, may be required to push saline water out of the pool.

Strategies for making the infrequent major drawdowns more compatible for sustaining some fish populations are listed below.

Strategies:

- (a) Deepen the borrow ditch all around the flood side of the pool levee to achieve 7- to 8-foot water depths in some areas to improve fisheries habitat and increase the levee height.
- (b) Deepen other ditches and ponds in the pool to 5-8 feet deep and a minimum of 20 feet wide to improve fisheries habitat.
- (c) Extend the life of the pool through drawdowns that would result in soil compaction and oxidation of accumulated organic matter when dry periods or drought allows. Fire should be used to reduce the organic matter accumulation when opportunities become available.

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- (d) Provide family-oriented public use of the fishery resource, but limit fishing to the period from March 15 through October 15 inside the pool and year-round on customary and traditional fishing areas within the refuge to minimize disturbance to wintering waterfowl. Rookeries should be protected.
 - (e) Establish and maintain healthy and adequate sport fish populations by working with the Louisiana Department of Wildlife and Fisheries and the Service's Fisheries Assistance Office personnel to obtain fish population data on an annual basis through electro-fishing, controlled angling, netting, angler surveys, and other standard sampling techniques.
 - (f) Take all the preventive measures possible to reduce or eliminate the largemouth bass virus within refuge waters.
 - (g) Stocking of fish in refuge waters will be limited to measures aimed at maintaining balanced fish populations or replacing populations decimated by unusually severe or atypical losses due to climatic or environmental factors. Native species of fish would be the first choice for introductions. The refuge would work with the Louisiana Department of Wildlife and Fisheries and with the Natchitoches National Fish Hatchery to produce native bass fry for stocking. If native species cannot be used, non-native species may be used. Stocking refuge waters with catchable-sized sport fish specifically to support recreational fishing is prohibited.
 - (h) By 2015, update the fisheries management plan.

Objective B-2: Migratory Waterfowl - Provide wintering habitat for ducks and geese to return to their historic 1970s population levels, consistent with the objectives of the North American Waterfowl Management Plan's Gulf Coast Joint Venture, Chenier Plain Initiative (4,500,000 ducks and 526,000 geese, respectively).

Discussion: Coastal Louisiana is one of the most important waterfowl areas in North America, providing wintering grounds for huge numbers of waterfowl. Concern over waterfowl population declines in the 1980s resulted in the establishment of the North American Waterfowl Management Plan, which focused the attention of federal, state, and private conservation groups on critical wintering and breeding areas. The Gulf Coast, including southwest Louisiana, was selected as one of the critical wintering areas. The Gulf Coast Joint Venture was established as a federal/state/private partnership to address wintering waterfowl population goals and habitat needs. The North American Waterfowl Management Plan, including the Gulf Coast Joint Venture, has expanded to encompass management of all birds.

Lacassine Refuge pintail counts regularly approach 50 percent of the entire southwest Louisiana total and occasionally exceed 80 percent, indicating the significance of this refuge to the regional distribution of pintails. Lacassine Pool has been documented as a key diurnal roost site for harboring pintails in southwest Louisiana, with pintails making frequent long round-trip journeys to foraging habitat at night.

The high wintering waterfowl densities in the area have resulted in high-cost waterfowl hunting leases and incessant hunting that makes sanctuary a high priority for waterfowl in this area. Indeed, the significance of Lacassine Pool as a sanctuary site for pintails may be unparalleled in the Mississippi Flyway. This sanctuary must be maintained in quality, secure habitat.

Strategies:

- (a) Refer to strategies listed under Objective A-1 on Lacassine Pool.
- (b) For each waterfowl impoundment, keep records annually of flood and drawdown dates, water levels, land treatments (e.g., discing and herbicide), and plant and migratory bird response to habitat availability.
- (c) Adjust land treatments to provide a complex of habitat types and maximize migratory bird response related to habitat availability.
- (d) Strive to get complete water control on all areas managed for waterfowl.
- (e) Provide optimal water conditions (mid-August through mid-November) for early migratory birds and shorebirds.
- (f) Create a partnership between the refuge and the research community to promote monitoring and research to determine the most effective methods for waterfowl management.
- (g) Record all management actions and implement adaptive management strategies to evaluate food production and wildlife response, and modify management actions to improve wildlife habitat.
- (h) Conduct waterfowl surveys on a unit-specific and species-specific basis from September through February. Habitat conditions and waterfowl numbers should be correlated to the degree possible to determine preferred habitat conditions throughout the winter period.
- (i) Within the pool, note areas preferred or avoided by waterfowl and investigate habitat conditions to determine if there is a correlation. Because of differences in species habitat preferences both within and among years, data should be recorded, archived, and analyzed over a period of years before irreversible actions are taken.
- (j) Expand the objectives of the waterfowl surveys conducted strictly for the purpose of determining peak waterfowl populations on the refuge and expand the survey to other southwest Louisiana refuges.

Objective B-3: Mottled Ducks - Provide nesting, brood-rearing, and molting habitat for mottled duck populations to contribute to the goals and objectives of the North American Waterfowl Management Plan's Gulf Coast Joint Venture, Chenier Plain Initiative. Enhance knowledge of this species to improve management.

Discussion: Mottled ducks are a resident species with a range limited to the western Gulf Coast and Florida. The Louisiana Chenier Plain population estimate is about 170,000 birds, making this region one of the most important in the world for this species. Mottled ducks must meet all their life cycle requirements from their year-round home of Gulf Coast marshes and associated agricultural habitats. These habitat requirements vary seasonally. As such, special consideration is warranted to ensure that the unique needs of this species are met.

Mottled ducks have a long potential nesting period, from February through mid-July, and as a result frequent re-nesting attempts are common. Typical mottled duck nesting habitats are cordgrass ridges and other elevated sites within coastal marsh complexes, and cattle pasture and rice production zone

of the former coastal prairie. Mottled ducks frequently select nest sites with some overhead cover, but typically abandon sites once they are overgrown with baccharis, willow, or Chinese tallow.

Strategies:

- (a) Provide brood rearing water habitat through July, in at least one field of Units A, C, and E, as part of a late-summer drawdown.
- (b) Participate in multi-agency efforts to capture and band pre-season mottled ducks consistent with coordinated banding objectives.
- (c) With partners, monitor mottled duck population trends on the refuge through summer/fall/winter aerial surveys and other rigorous and repeatable surveys as feasible.
- (d) Support mottled duck research that seeks to clarify limiting factors and/or their mitigation.

Objective B-4: Cavity-nesting Ducks - Conduct a program of 50 to 60 well-maintained nest boxes for wood ducks and black-bellied whistling ducks.

Discussion: Nest boxes can make a positive contribution to the well being of wood ducks and black-bellied whistling ducks. Lacassine Refuge lies within a narrow band where the ranges of wood ducks and black-bellied whistling ducks overlap. Both species are cavity-nesting ducks. About 80 percent of the duck nests in boxes on the refuge are wood ducks and 20 percent are black bellies. Black-bellied ducks are increasing on the refuge with a corresponding increase in nesting pairs utilizing nest boxes.

Wood ducks are year-round residents in the forest lands of the United States. Preferred habitats include forested wetlands, wooded and shrub swamps, tree-lined rivers, streams, sloughs, and beaver ponds. Wood ducks feed on acorns, other soft and hard mast, weed seeds, and invertebrates found in shallow flooded timber, shrub swamps, and along stream banks. Wood ducks nest in cavities in trees within a mile of water and brood survival improves with proximity to water. Due to conversion of forestlands to agriculture, forestry practices, and competition for nest sites from a host of other species, natural cavities are considered a limiting factor in reproduction. Nest boxes are commonly used to supplement natural cavities.

Black-bellied whistling ducks are also cavity-nesting ducks but have been documented nesting on the ground. They tend to nest later than wood ducks, with first nesting beginning in late-April through mid-September. The late nesting reduces competition with wood ducks for nest sites.

Strategies:

- (a) Operate wood duck nest box program to meet regional guidelines dated May 23, 2003 (USFWS 2003), taking care that no more boxes than can be adequately maintained over the long-term be erected.
- (b) Evaluate nest use and nesting success in boxes and adjust the program accordingly.
- (c) Use partners, volunteers, interns, refuge personnel, and others to construct, install, and clean boxes at least once and as many as 2-4 times annually.

Objective B-5: Shorebirds - Provide 200-300 acres of late summer/fall foraging habitat for shorebirds to contribute to the goals of the U.S. Shorebird Conservation Plan; in addition, coordinate cooperative farming program to further enhance shorebird habitat where feasible.

Discussion: The Gulf Coastal Prairie Region is one of the most important regions in the United States for shorebirds. The region is located along a major migration route for many types of shorebirds, and numerous species breed and winter there. The region's strategic location is coupled with a diversity of habitat types favored by shorebirds, including beaches, marsh, estuarine tidal flats, rice fields, and crawfish ponds. Most shorebirds feed largely upon invertebrates, including insect larvae, mollusks, crustaceans, and various worms. A combination of invertebrate-rich, non-vegetated to sparsely vegetated, and exposed mud flats to shallowly flooded (1/4 to 4 inches) areas, would satisfy the foraging requirements of many species of shorebirds.

Fall is typically the driest season in southwestern Louisiana. Additionally, most rice fields and crawfish ponds have been drained by this time and are largely vegetated. These facts lead to the assumption that shorebird habitat is most limited in the region during the fall when any habitat the refuge could provide would be heavily used.

American woodcock (*Scolopax minor*) are an atypical shorebird that uses forested habitats and moist open areas vegetated with herbaceous plants or shrubs. Woodcock occur throughout the forested portions of the eastern United States. Woodcock populations in this region have been on the decline in recent decades.

Preferred wintering habitat for woodcock includes moist bottomland hardwood forests with brush and understory often found in overgrown fields and spoil banks, especially when in close association with agricultural fields and old field succession. The scrub/shrub and dense bottomland hardwood habitats created for migratory songbirds would double as good daytime cover for woodcock.

Strategies:

- (a) Where possible, provide 200 – 300 acres of shallow water and mudflat habitat suitable for shorebird foraging during the fall migration period (i.e., July – November). At least one 50- to 100-acre-block of suitable habitat should be provided at all times for roosting habitat, particularly during the driest periods when little other habitat is available in southwest Louisiana.
- (b) In keeping with the American Woodcock Management Plan, develop and/or maintain preferred woodcock habitat where it exists on the refuge. Crepuscular (i.e., twilight) cover and foraging habitat for woodcock includes thickets and shrub areas with high vertical stem density in the understory. Preferred nocturnal habitat includes wet agricultural fields (i.e., not fall disced) and wet "old fields" with exposed soil and patchy cover 19 to 39 inches in height created by cool fall burns.

Objective B-6: Colonial Waterbirds - Maintain and enhance nesting and foraging habitat for colonial waterbirds to contribute to the goals and objectives of the North American Waterbird Conservation Plan.

Discussion: Lacassine Refuge provides outstanding foraging and nesting habitat for a variety of waterbird species. Approximately 15 historic colonial waterbird nesting sites are present on the refuge, of which 7-8 are active in any given year. Nesting colonial waterbird species include the neotropical cormorant; anhinga; great blue, green (*Butorides virescens*), tricolored, and little blue herons; black-crowned (*Nycticorax nycticorax*) and yellow-crowned (*Nyctanassa violacea*) night-

herons; cattle (*Bubulcus ibis*), great, and snowy egrets; white-faced and white ibises; and roseate spoonbill. Other nesting, non-colonial waterbirds present include the purple gallinule, common moorhen, pied-billed grebe, and least bittern.

Unit C contains a vegetated spoil bank that is consistently utilized as rookery habitat. Some of the spoil bank nest trees are declining, presumably from flooding stress and from physical and chemical damage inflicted by the nesting birds. Maintenance of existing spoil bank vegetation and periodic tree replanting are needed to ensure continued colonial waterbird nesting in the area.

Colonial nesting waterbirds also use groves of cypress in the Lacassine Pool, as well as other habitats, such as extensive stands of giant bulrush. Colonial nesting waterbirds are sensitive to some types of disturbance, and may abandon rookery sites if disturbed at critical times during the breeding cycle.

Strategies:

- (a) Monitor historic rookery areas and survey potential suitable habitat in other portions of the refuge. Maintain records of species and estimated numbers. Supplemental data that might be useful to collect include dates of nesting initiation; fledging date; water depths below rookery; nest substrate vegetation, including vegetative composition; and tree height.
- (b) Protect active rookeries from excessive disturbance during the breeding season. Utilize signs to inform the public to respect the buffer zone and minimize disturbance.
- (c) Maintain existing and provide additional colonial waterbird nesting habitat through water level management, tree planting, and beneficial dredge spoil placement.

Objective B-7: Marsh Birds - Use prescribed fire and mowing to protect and enhance nesting habitats in the impounded freshwater marshes for marsh birds, such as the purple gallinule, common moorhen, pied-billed grebe (*Podilymbus podiceps*), least (*Ixobrychus exilis*) and American bittern (*Botaurus lentiginosus*), and king rail (*Rallus elegans*).

Discussion: The term marsh bird, as used in the North American Waterbird Conservation Plan, includes a variety of species from several different families of birds, such as rails, grebes, bitterns, coots, and gallinules. Lacassine Refuge provides excellent foraging and nesting habitat for a variety of marsh bird species. High-conservation priority marsh bird species known or expected from Lacassine Refuge include black rail (*Laterallus jamaicensis*), American bittern, king rail, yellow rail (*Coturnicops noveboracensis*), sandhill crane (*Grus canadensis*), least bittern, and purple gallinule. Purple gallinules, common moorhens, and least bitterns breed on the refuge. The refuge conducts surveys for purple gallinules and common moorhens during August of each year via boat transects.

Prescribed fire is a frequently used management tool in marsh ecosystems. The effects of prescribed fire on nesting and wintering marsh birds needs further study. The effects of certain other wildlife management techniques on marsh birds, such as the timing and extent of water drawdowns or input, also deserve further investigation.

Strategies:

- (a) Continue monitoring purple gallinule and common moorhen and seek to expand monitoring efforts to include pied-billed grebe, least and American bittern, and king rail.

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- (b) Implement the Service's secretive marsh bird survey protocol and contribute information to regional and national databases.
 - (c) Investigate possibilities and methodologies to sample the refuge for high conservation priority transient/wintering marsh bird species, such as black and yellow rails.
 - (d) Analyze the existing gallinule/moorhen database and compare to management practices in the survey unit (e.g., prescribed burns and vegetation/water level management).
 - (e) Investigate the potential for providing sandhill crane roosting and foraging habitat on the refuge, such as restored prairie, or corn or sorghum stubble fields.

Objective B-8: Non-game Resident and Migratory Land Birds - With partners on private and Service lands, improve habitat values on marshes, impoundment levees, shrub-dominated sites, forested areas, and grasslands for non-game migratory and resident landbirds to contribute to the Partners in Flight objectives as outlined in the Coastal Prairies (Physiographic area #06) Partners in Flight Bird Conservation Plan.

Discussion: Concerns about unfavorable population trends for neotropical migratory land birds led to the formation of Partners In Flight, a non-governmental organization dedicated to abating those declines. Though the initial focus of Partners in Flight was on long-distance neotropical migratory birds, the group's emphasis has expanded to encompass nearly all species of resident and migratory land birds. Land birds, as defined by Partners in Flight, include passerine birds (e.g., songbirds), woodpeckers, raptors, cuckoos, and other bird species besides waterfowl, waterbirds, and shorebirds.

Approximately 400 acres of bottomland hardwood forest is present on the refuge, where a Monitoring Avian Productivity and Survival station has been established to collect data on breeding woodland birds. Additional woody vegetation is present on canal and stream banks, and also on a series of ring levees in the Lacassine Pool that are associated with former oil and gas exploration sites. An invasive exotic plant species, Chinese tallow, is a dominant woody species on the ring levees. Refuge staff have worked to eliminate tallow from some levees, and to replant native species, such as bald cypress, tupelo gum, black gum, red maple, common persimmon, sugarberry, live oak, Nuttall oak, swamp dogwood, red mulberry, wax myrtle, and buttonbush.

Though forest bird habitat is currently limited on the refuge, there is additional privately owned forested habitat within its acquisition boundaries, along Lacassine Bayou and the Mermentau River. Analysis of weather radar indicates that forested river bottoms in southwestern Louisiana host significant numbers of migrating land birds during the spring.

Lacassine Refuge has ample opportunities to create, restore, and enhance habitat for grassland-dependent land birds. Louisiana hosts grassland-breeding bird species, such as dickcissel and eastern meadowlark, while other grassland-dependent species, such as Henslow's and LeConte's sparrows, winter in the state. The refuge's on-going restoration of the Duralde Prairie site has benefited grassland and shrub/scrub bird species, such as eastern meadowlark, northern bobwhite, and loggerhead shrike.

Strategies:

- (a) Establish points and conduct point counts throughout the refuge to monitor bird species and document change related to management actions.

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- (b) Investigate opportunities for protection of existing forested areas within the approved acquisition boundary along Lacassine Bayou and the Mermentau River.
 - (c) With partners or other means, seek to restore forested areas along river corridors in southwestern Louisiana.
 - (d) Work with partners to create, restore, and enhance habitat for grassland-dependent land birds (Objective A-4, Coastal Prairies).

Objective B-9: Alligators - In coordination with the Louisiana Department of Wildlife and Fisheries, monitor alligator populations, establish a desirable alligator density objective for the refuge within five years of the approval of this plan, and cooperate with the Department in setting annual harvest quotas.

Discussion: American alligators are opportunistic carnivores and a top predator on the refuge. Smaller alligators (i.e., less than five feet long) primarily feed on crustaceans, fish, and insects. Larger alligators primarily feed on mammals (e.g., nutria and muskrat), birds, fish, reptiles, and crustaceans.

The alligator population on the refuge needs to be monitored and population objectives established. Population management of alligators is recommended to maintain healthy alligators and other wildlife, as well as the ecosystem in general on the refuge. To date, alligator populations have been kept in check in most areas of the state, including the refuge, by a harvest program that is closely regulated by the Louisiana Department of Wildlife and Fisheries. Prior year harvest statistics indicate that the refuge's harvest program has followed the Louisiana Department of Wildlife and Fisheries recommendation some years and in other years harvested below the allotted quota.

Alligator nest densities are much higher in the pool compared to other fresh marshes on the refuge. The 5-year average (1997-2001) nest density for the pool is 1 nest per 43 acres while the 5-year average nest density outside the pool is 1 nest per 106 acres. Alligator densities are much higher inside than outside the pool. Alligators appear to prefer maidencane for nesting in the pool.

The harvest program on Lacassine Refuge was initially authorized because of reported low weight-length ratio for alligators, indicating possible overpopulation and the need to increase harvest rates to maintain a healthy population. Harvest on southwest Louisiana refuges generally consists of trappers selling their alligators to processors whole at the boat ramp, limiting the "historic Cajun tradition" of families skinning the alligators locally. In an attempt to retain the benefits of alligator harvest in the local community, community members have initiated an alligator hide cooperative to buy and process hides. This program, in theory, will create local jobs, provide increased revenue, and de-commercialize the harvest program. In the 2001 trapping season, one of Lacassine Refuge's alligator trappers participated in the alligator hide cooperative and was paid significantly more than trappers selling to the traditional buyers.

Strategies:

- (a) Continue consulting with the Louisiana Department of Wildlife and Fisheries to monitor annual harvest, conduct more intensive aerial alligator nest surveys, and collect all data necessary to make sound biological decisions.

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- (b) Consult with the Louisiana Department of Wildlife and Fisheries to develop a customized harvest strategy that would focus on achieving target population goals, including desired age/sex composition.
 - (c) By 2018, revise the alligator and furbearer harvest plan.
 - (d) Continue prohibition of alligator egg collection.

Objective B-10: Resident Wildlife (Mammals, Amphibians, Reptiles) - With partners, maintain and develop diversified habitats and promote management actions that would support healthy populations of indigenous wildlife species to meet the mission of the National Wildlife Refuge System.

Discussion: Lacassine Refuge supports a variety of habitats typical of southwest Louisiana and, consequently, hosts the full range of wildlife species common to the area. Sound management of the fresh marshes, agricultural areas, and various other habitats would allow the refuge to maintain current population levels. Population monitoring and a number of control measures can be implemented to provide recreational opportunity and maintain wildlife populations at or slightly below carrying capacity (i.e., the population level that can be sustained over the long term by the available habitat).

Whitetail deer are the largest mammals on the refuge and are well adapted to the habitats found there. Refuge habitat can support a population of ± 300 deer. Deer numbers should be reduced annually to minimize the impact on both the habitat and problems caused by parasites/diseases within the deer herds. With few predators controlling deer population, hunting provides recreational opportunity and is the preferred method to control the deer population. A recommended harvest of 30 percent of the deer herd should be taken annually and consist of a 50:50 ratio of bucks and does.

Two species of rabbits, cottontail and swamp, are found on the refuge in abundance. A recent study shows that both rabbits breed throughout the entire year at this latitude, and the number of rabbits produced annually in this type habitat is greater than that of rabbits in more upland habitats. Even though many predators prey on these rabbits, population numbers are considered to be high. The annual harvesting of rabbits from the refuge would have no negative impact on the population and would allow the opportunity for recreational hunting of these under-utilized species.

As a freshwater marsh, Lacassine Refuge is also a haven for reptiles and amphibians. Despite the dominance of these creatures on the landscape, little is known about their populations on the refuge. In 2001, the refuge began participating in a statewide monitoring program for frogs known as the Louisiana Amphibian Monitoring Program. Three permanent sites have been established and are monitored during the monitoring-specific period of the year. In addition to the amphibian monitoring program surveys, drift fences have been in place on the refuge since 2001 to monitor terrestrial reptiles and amphibians. The refuge has plans to expand its reptile and amphibian monitoring effort to determine the effects of oil and gas development on these sensitive species.

Strategies:

- (a) Continue to use hunting as a tool to manage wildlife populations where it is compatible with other refuge purposes and activities.
- (b) Continue and expand the monitoring program for reptiles and amphibians. Incorporate control sites for the oil and gas disturbance study into a long-term monitoring program.

(c) Protect and monitor alligator snapping turtle populations on the refuge. Identify and protect their nest sites. Determine the methods and frequency of intentional and incidental harvest and their importance to the local community.

Objective B-11: Species of Special Concern - With partners, manage populations and habitats to support and increase numbers of threatened and endangered species and species of concern to meet the objectives of the National Wildlife Refuge System Improvement Act of 1997.

Discussion: Species of concern found on the refuge include the bald eagle, federally listed as threatened, and the paddlefish, a species of management concern in Region 4 of the Service. Lacassine Refuge may also attract transient Louisiana black bears, federally listed as threatened.

The bald eagle was first listed on March 11, 1967, and several recovery plans have been written to recover the species. Louisiana's nesting bald eagle population declined during the 1960s and 1970s, presumably due to pesticide-induced reproductive failure, habitat loss, and the illegal take of adult birds. The state's nesting population has rebounded since the mid-1970s, due in large part to prohibitions of DDT use in the United States, increased environmental awareness, and the efforts of state and federal agencies to conserve and restore habitat and to enforce wildlife regulations. Although the bald eagle was recommended for delisting in 1999, it was determined that additional data would be needed before taking this action. It is currently designated as threatened in its current range of the conterminous United States and Alaska. Current threats are loss of nesting habitat due to development along the coast and near inland rivers and waterways.

Bald eagles are common in areas with large expanses of aquatic habitats (e.g., coastal areas, rivers, lakes, and reservoirs) with forested shorelines or cliffs. Within Louisiana, they are typically associated with forested wetlands adjacent to marsh or open water. There are historic records of nesting bald eagles on private land near the refuge headquarters. The Lacassine Pool potentially provides excellent foraging habitat for bald eagles, but large trees for perching and nesting are currently limited.

Paddlefish are a Fish and Wildlife Service Region 4 species of management concern. Louisiana Department of Wildlife and Fisheries Inland Fisheries personnel have identified Lacassine Bayou and the Mermentau River as extremely important areas for paddlefish.

Paddlefish populations have declined throughout much of their historic range in North America due to habitat changes and over-fishing, mostly to supply the caviar market. Due to their scarcity, and to threats posed from over-harvest, no harvest of paddlefish is currently allowed in Louisiana. Despite prohibitions on harvest, some incidental take of paddlefish in nets and with other tackle sometimes occurs. The refuge prohibits commercial fishing in the portions of waterways that are within the refuge's boundaries and jurisdiction.

Both Lacassine Bayou and the Mermentau River have experienced water quality impairment, with turbidity thought to be one of the major water quality issues. The watersheds are subject to significant non-point source pollution from agricultural run-off.

The Louisiana black bear was listed on January 7, 1992. It is currently designated as threatened in its entire range of Louisiana, Mississippi, and Texas. The Louisiana black bear is a habitat generalist and often over-winters in hollow cypress trees either in or along sloughs, lakes, or riverbanks in bottomland habitat of the Tensas and Atchafalaya river basins.

Lacassine Refuge is outside of known occupied habitat (e.g., an area with resident reproducing female Louisiana black bear), however may receive rare use by transient animals. The closest occupied habitat is in St. Mary Parish, Louisiana. The male Louisiana black bear can travel far from occupied habitats and has been documented in every parish in Louisiana at least once. Lacassine Refuge does not provide habitat typically used by bears, but such long-ranging individuals may pass through and use the area.

Other wildlife and plant species of concern that are known or suspected to occur on the refuge include the alligator snapping turtle, northern pintail, roseate spoonbill, glossy ibis (*Plagadis falcinellus*), about 25 other wildlife species (e.g., mostly birds) of management concern in Region 4 of the Service, and four plant species listed in the Louisiana Natural Heritage Program database of rare, threatened, and endangered plant species.

Strategies:

- (a) Continue to monitor bald eagle use of the refuge as part of the Mid-Winter Bald Eagle Survey.
- (b) To protect turtles and paddlefish, continue prohibition on the use of commercial fishing gear within the refuge boundaries.
- (c) To help conserve paddlefish, improve water quality in the streams through reforestation incentives via the Partners for Fish and Wildlife Program, or through acquisition of streamside habitat within the approved acquisition boundary.
- (d) Provide assistance to Louisiana Department of Wildlife and Fisheries on state jurisdictional waters within the refuge boundaries with population monitoring and restoration efforts and work with them to ban trammel, gill, and hoop nets.
- (e) With partners, investigate opportunities to protect the paddlefish spawning area on Bayou Nezpique through landowner incentives or acquisition.
- (f) Continue to monitor wading bird nesting colonies for presence of roseate spoonbill and glossy ibis; provide information on numbers and locations to Louisiana Natural Heritage Program.
- (g) Where appropriate and feasible, initiate surveys for other federal species of management concern or state-listed rare species, such as winter surveys for Henslow's sparrow and grasshopper sparrow (*Ammodramus savannarum*) on the Duralde Prairie.
- (h) Where appropriate and feasible, undertake management actions to provide habitat for other federal species of management concern or state-listed rare animal species, such as installation of nest platforms for osprey.
- (i) Report any occurrences of other state-rare animal species on the refuge to Louisiana Natural Heritage Program.

GOAL C: OIL AND GAS INFRASTRUCTURE AND ACTIVITIES - Manage petroleum infrastructure and activities to protect migratory birds, fish, and other wildlife and their habitats.

Objective C-1: Protection and Management - Increase protection and management of petroleum activities to minimize impacts on migratory birds, fish, and other wildlife and their habitats.

Discussion: Lacassine Refuge has had oil and gas exploration and production since its creation in 1937, with a total of 82 wells drilled on refuge property. Currently, only two wells are in production. Most have been properly plugged and abandoned, but five of the remaining wells are listed in the “shut-in” status. A “shut-in” well is not producing and either has mechanical problems down hole, or is not economically feasible to produce hydrocarbons. “Shut-in” wells can become potential environmental threats.

Oil and gas exploration companies now use seismic surveys to detect petroleum resources. These surveys can temporarily disrupt habitat and disturb wildlife.

Approximately 15 oil and gas transmission pipelines traverse the refuge. These pipelines require a right-of-way agreement with the Service. It is important to establish good communications with the different companies that have these rights-of-way and require them to report directly to the refuge all releases of any size on refuge property. Efforts should be made to determine the route that each pipeline covers and what products are passing through the refuge so that, if a leak did occur, a responsible party could be identified and the cleanup process could begin as soon as possible. Oil and gas policy is described in Chapter II.

Strategies:

- (a) Maintain good communication with oil and gas exploration and development companies so that they are well aware that the refuge is closed to most surface activities from October through March to minimize disturbance to wintering waterfowl.
- (b) Require all spills of any quantity to be reported to the refuge so proper and prompt cleanup can be assured.
- (c) By 2015, update the oil and gas management plan.
- (d) Ensure that all future management for existing oil and gas transmission lines and operations are managed per Fish and Wildlife Service Policy. (Reference Fish and Wildlife Manual: FWS 603, Section 2.11 D, and Chapter II of this Comprehensive Conservation Plan, Refuge Related Problems, Oil and Gas Activities).

Objective C-2: Reclamation - Increase surface reclamation at former petroleum extraction sites to improve habitat for wintering migratory birds and other species.

Discussion: As the surface owner, Lacassine Refuge has the right to require any old, out-of-use equipment and wells that are not in production to be removed so that sites can be returned to wildlife habitat.

Ring levees built around wells have typically been left behind by oil companies when extraction ceases and the well is abandoned. The ring levees then become nuisances because they displace native habitat and are reservoirs of non-native and invasive species like Chinese tallow.

Strategies:

- (a) Identify wells that need to be plugged and abandoned, remnant equipment that needs to be removed, and possible related contamination issues and communicate these needs to the responsible oil and gas company.

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- (b) Allocate the staff time necessary to coordinate new activities and cleanup.
 - (c) Develop a database to track well status and pipeline locations, along with current ownership.

GOAL D: PUBLIC USE MANAGEMENT - Encourage outdoor wildlife-dependent public use of Lacassine National Wildlife Refuge to the extent that it is compatible with the refuge purposes.

Objective D-1: Visitor Services - By 2012, complete steps to enhance the refuge's infrastructure and operations to provide for quality, wildlife-dependent public use.

Discussion: The current public use development plan was prepared in 1987. The plan would be revised as a step-down management plan for visitor services. It would address the needs of refuge visitors and current and future demands for visitor services and recreation. All visitor service activity programs and facilities would be wildlife-dependent and compatible with the purposes of the refuge. The plan would include a system for monitoring and evaluating the effectiveness of the visitor service program annually.

Directional signs to the refuge along Highway 14 are placed and maintained by the state highway department. These signs are nonstandard Fish and Wildlife Service signs and would be replaced. All refuge roads are graveled and are maintained (i.e., graded) on a regular basis by refuge staff. Gravel parking lots are located at two boat launches at Lacassine Pool and at the Unit B fishing area. During peak fishing use periods, visitors are limited by parking lot capacity. There are no permanent public restroom facilities available at Lacassine Pool or Unit B; however portable toilets are available.

The refuge does not have a visitor center or an audio/visual program designed for welcoming and orienting visitors. The visitor center at Cameron Prairie National Wildlife Refuge would serve as the visitor center for all refuges that make up the Southwest Louisiana National Wildlife Refuge Complex. Renovations at Cameron Prairie Refuge would provide for exhibit space to interpret and highlight the unique features of Lacassine Refuge.

Strategies:

- (a) By 2012, develop an up-to-date step-down visitor services management plan that includes recommendations for wildlife-dependent recreation. The visitor services plan would encompass environmental education, interpretation, wildlife observation, wildlife photography, and outreach.
- (b) Develop the means to obtain accurate visitor counts and projected visitation.
- (c) Improve quality and quantity of information about the refuge, including signs and radio messages.
- (d) Continue to maintain the road to Lacassine Pool.
- (e) Develop a law enforcement step-down plan by 2008.
- (f) Hire one full-time law enforcement officer.
- (g) Hire a park ranger for visitor services (e.g., environmental education and interpretation) to work under the direction and guidance of the Complex outreach coordinator.
- (h) Make various specific improvements to the refuge facilities and operations over the coming five years, including the following:

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- Work with the State of Louisiana Highway Department to standardize all highway signs regarding look and information; use Lacassine National Wildlife Refuge on all signs.
 - Keep kiosk/public contact/boardwalk areas clean and gate areas well mowed.
 - Rebuild the kiosk at the office.
 - Place an informational kiosk at fishing area at end of Streeter Road.
 - Build public restrooms at Lacassine Pool.
 - Devise a plan to deal with litter as visitation increases.

Objective D-2: Hunting - Offer quality hunting experiences for hunters; review the refuge hunting program on an annual basis to monitor its success and to consider ways of improving the program.

Discussion: Lacassine Refuge has an active hunting program for waterfowl and white-tailed deer. There is not much hunting pressure during teal season; instead, winter waterfowl hunting for ducks, coots (*Fulica americana*), and geese is more popular. Currently, 10,434 acres are open to waterfowl hunting. The Unit B farm unit is a lottery hunt area for youth and senior youth hunters open only during the second split of the state waterfowl season on Saturday (youth) and Wednesday (senior). All hunters are required to obtain a hunting brochure, which also serves as the permit when signed. There is not a central check station for hunters to check in bagged birds, except for lottery hunters. Hunters are able to access the refuge from various locations, making it difficult to get hunter use numbers.

Archery only hunting for white-tailed deer is also allowed by permit during the month of October. Hunters may utilize the entire refuge excluding the headquarters area. Deer hunters are requested to provide harvest information, but it is not mandatory.

No trapping has occurred on the refuge since the winter of 1988, because nutria and muskrat populations have not warranted a harvest.

Strategies:

- (a) Allow the harvesting of white-tailed deer with archery equipment from approximately October 1 until approximately October 31, or the beginning of duck season, to control deer numbers and maintain a healthy deer herd. Consider expanding the season to include a 1- to 2-day, shotgun-only hunt for deer herd control.
- (b) Adjust waterfowl hunting schedule to coordinate with Sabine National Wildlife Refuge. Both refuges would be open four days a week. This action would eliminate one day from the current schedule for Lacassine Refuge and add one day for Sabine Refuge.
- (c) Continue the lottery waterfowl hunt for youths and seniors during second split of duck season and general adult lottery hunt for both splits.

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- (d) During the lottery hunts place a temporary sign at head of Streeter Road that reads: "Observation Tower Closed until Noon - Hunt in Progress." Also, improve the crossovers/bridges used during the lottery hunt.
 - (e) Consider a special lottery season for rabbit hunting during the month of February, within the agricultural area and Gulf Intracoastal Waterway levee systems. Any such hunt must be sensitive to waterfowl disturbance and should be delayed until after the waterfowl season.
 - (f) Assess the feasibility of allowing commercial guiding. If guiding is allowed, it would be under the auspices of the Recreation Fee Demonstration Program.
 - (g) Modify lottery hunt blinds to make them safer and more accessible.
 - (h) Consider participating in the Recreation Fee Demonstration Program to charge fees for the lottery hunt and the refuge hunting permit.
 - (i) By 2012, update the hunting management plan.

Objective D-3: Fishing - Offer quality fishing experiences for anglers and review the refuge fishing program on an annual basis to monitor its success.

Discussion: Fishing has been the most popular public use on the refuge since it was established. Lacassine Pool, initially created to provide migratory waterfowl habitat, has become a prime largemouth bass fishing area. Problems associated with the fishing program include opening day traffic and parking congestion, auto speeding, fishing tournaments, and littering by anglers.

Anglers line both sides of the entrance road on opening day of fishing season awaiting their turn to launch into the pool. Parking facilities at launches are adequate on normal use days, but on opening day there is congestion. Law enforcement patrol the area and remedy situations as needed.

Speeding on Lacassine Pool access roads is a major safety issue, especially during fishing season. The easement road leading to the entrance road and the entrance road are zoned 45 mph and 35 mph, respectively. Speed limits are strictly enforced using radar devices. The refuge would adjust speed limits as needed to deter speeding and to protect wildlife.

Fishing tournaments have occurred on the refuge for a number of years. Tournament participants are encouraged to practice catch and release by tournament organizers. There have been conflicts between other refuge users and tournament anglers. Fish caught by tournament anglers were put back in the water after weigh-in at the boat launch. Complaints were made to staff about the sight of dead and dying fish left at the launch areas by other users. Tournament anglers are now required to release fish in the interior areas of the pool after weigh-in. Tournaments in the past were usually held on Mondays and parking and road traffic congestion mirror opening day issues. Other user groups tend to avoid the pool on tournament days. Several user conflicts have occurred due to fishing tournaments.

However, current Fish and Wildlife Policy states tournaments would be permitted as long as a determination has been made that events are compatible with the refuge purpose and the Refuge System mission. Well-planned tournaments can promote recreational fishing opportunities on refuges and be a source of conservation information and education for an angler.

Littering is widespread at Lacassine Refuge and it has become more of an issue at bank fishing sites. There are no trash receptacles on the refuge. Litter deposited in the pool sinks to the bottom and has no escape routes since the pool is a closed system of levees. It is likely that littering would worsen as more people fish in the pool. A yearly increase in the number of people using the pool may occur in the future.

Lacassine Refuge follows all state fishing regulations and in some cases may be more restrictive; regulations are available in the brochures located at the public use areas and headquarters. Creel surveys are used to estimate the number of boats and catch per effort. Electrofishing surveys are a tool used to assess the fishery in Lacassine Pool. Findings have indicated the need to enhance the fisheries through supplemental stocking. In an effort to increase angling opportunities, largemouth bass and bluegill (*Lepomis macrochirus*) have been stocked in the pool.

Lacassine Pool is restricted to 25 hp motors and includes surface drive motors. The Unit D impoundment within the pool is restricted to boats without motors. Canals and major bayous outside the impoundments have no restrictions on boat motor size.

Strategies:

- (a) Fishing tournaments would be permitted under a regulated schedule to minimize conflicts with other users. Permit fees would be assessed per tournament day and be commensurate with fees charged by other host landowners in the Southeast Region.
- (b) Develop more specific recommendations in a step-down management plan on fishing that would pursue a balance between the needs of “average anglers” and organized events so as to minimize conflicts between the two groups.
- (c) Maintain communication between the refuge and individuals with fishing interests.
- (d) Investigate safety measures to avoid boating accidents, such as requiring use of “Bike Safety” flags in boats in the pool.
- (e) With partners, strive to keep bank fishing area clean through a combination of education, signage, and litter pickup.
- (f) Assess the feasibility of allowing commercial guiding. If guiding is allowed, it would be under the auspices of the Recreation Fee Demonstration Program.
- (g) Charge a daily or annual launch fee with the proceeds dedicated to the refuge.
- (h) By 2011, update the sport fishing plan.

Objective D-4: Wildlife Observation and Photography – Enhance existing opportunities for wildlife observation and wildlife photography by upgrading certain facilities over the coming decade.

Discussion: There is a 3-mile auto tour route with interpretative signs at the Lacassine Pool public use area. Pull-offs are located along the drive to allow other visitors to continue along the drive safely. Visitors are encouraged to remain in their vehicles to enhance wildlife viewing. State Highway 14 passes by the refuge and is designated as the Jean Lafitte Scenic Byway. Although there are no designated hiking trails, visitors can walk along levees for additional wildlife observation opportunities. A short boardwalk through cypress swamp is located near the refuge headquarters.

The refuge has two viewing towers located at the Lacassine Wildlife Drive and Unit B. Both towers have scopes and wheelchair accessibility. These areas are optimally located to see wildlife populations while limiting disturbance to wildlife. There are no photography blinds.

Regulatory brochures, interpretive signs, and kiosks provide information and promote wildlife observation opportunities. Staff is involved in interpretation both on- and off-refuge. Lacassine Refuge participates in National Wildlife Refuge Week in conjunction with the Jeff Davis Parish Fair and the Migration Sensation Festival in support of International Migratory Bird Day to promote and support wildlife observation and photography on the refuge.

Strategies:

- (a) Concentrate on birders as an audience to promote wildlife observation.
- (b) Identify areas to enhance as hiking/bird watching locations.
- (c) Work with Friends Group to sponsor refuge photo contest.
- (d) Work with local photographer to generate list of good photo spots.
- (e) Develop a parking lot at Unit B, Wildlife Observation Trail North, and interpretive signs for wood duck and warbler boxes.
- (f) Through partners, install observation tower at Duralde Prairie.
- (g) Allow commercial guiding if determined feasible. Guiding, if allowed, would be under the auspices of the Recreation Fee Demonstration Program.

Objective D-5: Environmental Education and Interpretation - Coordinate with other refuges within the Complex to implement environmental education and interpretation.

Discussion: The current level of environmental education meets the minimum requirements. The refuge is striving to meet the standard-enhanced level of service. Staff would like to enhance and expand the environmental education program. A minimum of one full-time staff member is needed to ensure a quality environmental education program in the future.

Environmental education programs are not offered on-site because facilities and staff levels do not allow for such programs. Environmental education programs are currently brought into local school classrooms. Students view a slide program and do a short activity and receive an educational package.

Primary themes interpreted on the refuge include the ecology of the area, the native flora and fauna, and Service-wide mission and reasons for managing fish, wildlife, plants, and their habitats. Since the refuge lacks facilities, most interpretation occurs at Lacassine Pool.

Strategies:

- (a) With partners and Friends Groups, find a volunteer cadre to manage the environmental education program within the Complex for a variety of audiences.

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- (b) With partners, develop kits and material for environmental education, conduct teacher training, and provide kits/materials to the teachers on a check-out basis.
- (c) Use interns and Student Temporary Employment Program hires to develop and conduct environmental education programs.
- (d) As the outdoor interpretive program is enhanced, the following themes/topics should be considered:
- Coastal prairie;
 - Purpose/importance of this refuge for migratory waterfowl (e.g., pintails);
 - Management of freshwater wetlands;
 - Management of invasive species;
 - National wildlife refuges in Louisiana; and
 - Paddlefish in Mermantau River.
- (e) Interpret value of large, old live oaks in headquarters area.

Objective D-6: Friends, Volunteers, Partners, Interns - Provide additional opportunities for friends, volunteers, partners, and interns to assist the refuge and extend the reach of refuge staff.

Discussion: The refuge has a volunteer program administered by the wildlife biologist. To date, it has not been fully utilized but the refuge intends to expand the program and build a cadre of individuals to provide much needed support for refuge programs.

Staff has located and recruited volunteers as interns through contacts with colleges and universities and by word-of-mouth. Potential volunteers are interviewed, skills and work experiences are reviewed by staff, and references are checked. Training occurs by on-the-job supervision and one-on-one orientation.

The refuge has a Friends Group, the Friends of Lacassine National Wildlife Refuge, Inc., established in 1999. The Friends Groups has hosted a Migration Sensation Festival for several years. The refuge would like for the Friends Group to emphasize environmental education, volunteers, and other visitor service activities. The Friends Group may also assist with refuge efforts for facility development, improving interpretation and environmental education programs, and improving maintenance of public use areas, such as trails and fishing areas. The group has been supportive of the budding Friends of Southwest Louisiana National Wildlife Refuges and Wetlands group. The two groups have consulted with one another and have the potential to develop cooperative projects for the refuge.

Refuge partners include Jean Lafitte Scenic Byway District, Lafayette and Jennings Visitor Bureau, Friends of Lacassine National Wildlife Refuge, Inc., Future Farmers of America, Cajun Prairie Habitat Preservation Society, and the Jeff Davis Parish Fair Board.

Strategies:

- (a) Nurture and strengthen Friends Groups to include Friends of Lacassine National Wildlife Refuge and Friends of Southwest Louisiana National Wildlife Refuges and Wetlands.

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- (b) Partner with the Cajun Prairie Habitat Preservation Society for management of the Duralde Prairie tract.
 - (c) Continue partnership with local school groups for wood duck box project.
 - (d) Continue to cooperate closely with the Friends Group; work with the group to manage a volunteer program.
 - (e) Have staff identify projects that can be done by volunteers; develop specific job descriptions and timelines (e.g., develop volunteer group to do wood duck box monitoring);
 - (f) Promote the need for friends and volunteers through local media.
 - (g) By 2012, update the volunteers, friends, and partnerships plan.
 - (h) Encourage the Friends of Lacassine National Wildlife Refuge and the budding Friends of Southwest Louisiana National Wildlife Refuges and Wetlands to work together and partner on mutual projects of interest.

GOAL E: CULTURAL RESOURCES - Protect refuge cultural resources in accordance with federal and state historic preservation legislation and regulations.

Discussion: With the enactment of the Antiquities Act of 1906, the Federal Government recognized the importance of cultural resources to the national identity and sought to protect archaeological sites and historic structures on those lands owned, managed, or controlled by the United States. The body of historic preservation laws has grown dramatically since 1906. Several themes recur in the laws and the promulgating regulations. They include: 1) each agency is to systematically inventory the "historic properties" on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; 2) Federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and 4) the increasing role of consultation with groups, such as Native American tribes and African American communities, to address how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups.

The objectives and strategies below outline the Service's attempt to achieve its mandated historic preservation responsibilities in a way consistent with the agency's and the refuge's mission.

Objective E-1: Survey - Over the life of the comprehensive conservation plan, assess the feasibility of conducting a refuge-wide archaeological survey.

Strategies:

- (a) Contact the State Historic Preservation Officer to determine if any known archaeological sites exist within the vicinity of the refuge.
- (b) Determine the cost of conducting the study and seek resources to accomplish the work.
- (c) Consult the Regional Historic Preservation Officer for guidance.

Objective E-2: Education - Develop and implement an educational program that would provide an understanding and appreciation of the refuge's ecology and the human influence on the region's ecosystems.

Strategy:

(a) Work with local ethnic groups (e.g., Native American, African American, Creole, and Cajun) to develop education programs regarding cultural heritage and history.

Objective E-3: Cultural Resources Management Plan - By the year 2020, develop a step-down cultural resources management plan.

Strategy:

(a) Consult the Regional Preservation Officer for guidance.

GOAL F: REFUGE COMPLEX OPERATIONS - Develop and maintain the Southwest Louisiana National Wildlife Refuge Complex Headquarters to 1) support, direct, and manage the needs, resources, and staff of Cameron Prairie, Lacassine, Sabine, and Shell Keys National Wildlife Refuges and their relationship with each other; 2) manage the role of the Service as a partner in the multi-agency Cameron Creole Watershed Project; and 3) interact with the state-managed Rockefeller Refuge.

Discussion: Each refuge that comprises the Southwest Louisiana National Wildlife Refuge Complex is known throughout the area for its distinctive features. Because the four refuges are identified by their individuality, each one would focus on the priorities that best represent their individuality. See the objectives and strategies for wildlife, habitat, and visitor services earlier in this section for this refuge's priorities.

During winter migration, visitors flock to the Lacassine Pool to observe large concentrations of waterfowl and other migratory birds. Its 3-mile wildlife drive is interpreted with educational signs and is ideal for visitors to learn about wildlife and habitat. This refuge would serve as the Complex's focal point for wildlife observation, photography, and interpretive programs. Habitat and wildlife management programs would complement these interpretive programs.

At Cameron Prairie National Wildlife Refuge, walking across the boardwalk and observing alligators, egrets, and other wildlife is a welcoming outdoor experience for members of the public as they approach the visitor center. Once indoors, many interpretive displays, from wildlife to cultural history, would allow visitors to learn to appreciate its uniqueness as a haven for wildlife and their diverse habitats and would be a priceless gift for present and future generations to enjoy. Cameron Prairie Refuge would serve as the Complex's outstanding location for environmental education programs for area students. Existing facilities, as well as planned facilities at the refuge, would form the perfect setting for outdoor learning. Habitat and wildlife management programs would complement the environmental education emphasis.

Sabine National Wildlife Refuge is the largest coastal marsh refuge on the Gulf of Mexico. Its vast habitats of brackish, intermediate, and saltwater marshes attract wintering and migrating waterfowl. Marsh restoration sites co-exist with oil and gas facilities that do not substantially interfere with the naturalness of the area and its ability to attract wildlife. It is ideal as an outdoor facility for scientists and would serve as a unique setting for wildlife and wetland research. Research would complement habitat and wildlife management programs and public use.

Shell Keys was established as a reserve and breeding ground for native birds and is closed to all public use.

Objective F-1: Complex Staffing - By 2010, any Lacassine Refuge staff members with responsibilities for Complex-wide programs and general administration would be stationed at the Cameron Prairie Refuge headquarters, as appropriate.

Strategies:

- (a) Personnel actions would be performed as appropriate to assign positions currently at the refuge that have Complex-wide responsibilities and general administration to the Complex headquarters.
- (b) Staff members within the entire Complex would be provided adequate equipment, such as computers, vehicles, and supplies, as well as training needed to perform their jobs.
- (c) Staff members would be provided a safe and healthy working environment.

Objective F-2: Complex Support - The Southwest Louisiana National Wildlife Refuge Complex would encourage and support each refuge's major focus (e.g., environmental education, interpretation, and research) and the relationship of these programs to wildlife and habitat management objectives and strategies.

Strategies:

- (a) Resources needed to attain success in achieving the objective would be allocated to address the highest priority needs of the Complex.
- (b) Complex staff would support individual refuge needs and would provide expertise and assistance as needed to each refuge's staff.
- (c) The Cameron Prairie Refuge Visitor Center would serve as the Southwest Louisiana National Wildlife Refuge Complex Visitor Center and would include interpretive displays and exhibits about Lacassine Refuge. It would be modified to interpret the purpose of Lacassine Refuge, other refuges in the Complex, the multi-agency Cameron Creole Watershed Project, and the interaction between the Service and the state-managed Rockefeller Refuge.

V. Plan Implementation

INTRODUCTION

The following projects reflect the basic needs of the refuge as identified during the development of this comprehensive conservation plan. The refuge's role in providing habitat for waterfowl in Southwest Louisiana is important and fulfills the mission of the refuge.

Implementation of these projects will contribute to the North American Waterfowl Management Plan for the Gulf Coast Joint Venture's Chenier Plain Initiative, the U.S. Shorebird Conservation Plan, the North American Waterbird Conservation Plan, the Partners in Flight Coastal Prairie Conservation Plan, Coastal Wetlands Planning, Protection and Restoration Act, Coast 2050: Towards a Sustainable Coastal Louisiana, and the Louisiana Coastal Area-Ecosystem Restoration Plan.

PROJECTS

PROJECT 1 – FRESHWATER IMPOUNDED MARSH (LACASSINE POOL)

The Lacassine Pool is a 16,614-acre freshwater wetland impoundment (i.e., closed system) completed in 1943. It comprises approximately 48 percent of the refuge acreage. About 30 miles of levees surround and/or bisect the pool. Units D, G1, G2, G3, G4, and G5 are fire management units within the pool. These are burned on a 3-year rotation with a goal being to reverse plant succession and establish open water/short vegetation - open water:plant ratios more desirable to waterfowl, preferably close to 50:50.

The pool is the most prominent feature of the refuge and serves as a waterfowl sanctuary and breeding area for resident birds, including mottled ducks, wood ducks, and fulvous whistling ducks. The pool is open to public recreational fishing March 15-October 15 annually and has at times represented a significant portion of overall annual visitation. A primary objective of the refuge is to optimize quality wintering waterfowl habitat while offering quality fishing to the public. Currently, active management includes water level management (fall drawdown to 4.00 M.S.L.), prescribed fire (late fall; 3-year rotation), and invasive plant control on adjacent and surrounding uplands.

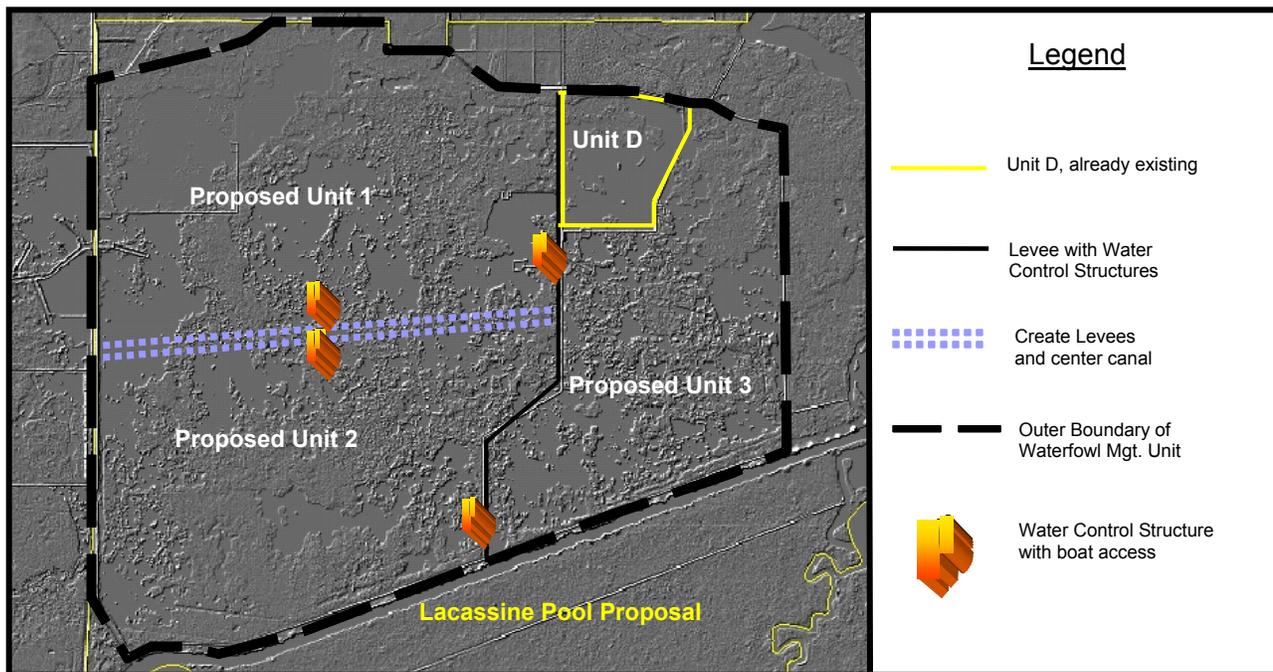
Several factors impede the implementation of best management practices specifically for waterfowl in the pool. These include: 1) impoundment size; 2) inability to dewater and flood as needed; 3) vegetation management; 4) sediment accretion; 5) public opportunities (e.g., fishing); and 6) cost.

The pool is currently divided into three semi-separate units, although they remain connected hydrologically via two open box culverts and two screw-gates. Units G1, G2, and G3 lie west of Tidewater Road and Frankfurt Levee (11,597 acres) and can be dewatered through a single 126' spillway (southwest spillway). Units D, G4, and G5 lie east of Tidewater Road and Frankfurt Levee (5,017 acres) and can be dewatered through a 126' spillway (southeast spillway) and a 42' spillway (northeast spillway). Currently, the pool is divided into approximately 2/3rds and 1/3rd and the existing structures that enable dewatering are not proportionate with available acreage. Existing spillways are inadequate for draining the pool for effective vegetation management (i.e., prescribed burning of the peat-like layer). Unit D is a 713-acre impoundment within 5,017 acres on the east side of the pool (east of Tidewater Road) and served as an experimental research unit in the early 1990s, when it was dewatered by pumping and subsequently burned. Unit D now has more desirable vegetation in contrast to other pool areas. Unit D has a year-round auto tour route around its circumference.

Southwest Louisiana has an average rainfall of 58" per year. Precipitation is the primary source of water into the pool. Because the pool bottom is equal to or higher than the surrounding outside water bodies, gravity water flow into the pool through existing water control structures are virtually unachievable, except during high water (flood) events. Only with the aid of pumps can water be placed into the pool from sources other than rainfall. Insufficient water has only on rare occasion been a concern (i.e., drought of 1998-2000). The primary management concern/challenge has and will continue to be finding feasible ways to remove water from within the pool in an expeditious manner to aid in prescribed burning.

Subdividing the pool into three additional compartments plus Unit D (Figure 8) would be accomplished as resources become available. The first phase would include separating the southeast 5,000-acre unit by replacing the two existing water passage ways with two new water control structures with boat passage gates, the placement of a mobile water pumping unit, and the removal of any interconnecting culverts so that the unit will have the capability to be fully isolated from the remaining 11,000-acre unit while it is being restored. Once determined successful, the next phase (installation of an additional dike across the remaining 11,000-acre unit with associated infrastructure) would occur over the remaining eight-year life of this plan. While the first phase is being completed, the remaining 11,000-acre unit would be managed using the strategies outlined in Objective A-1.

Figure 8. This proposal was also chosen by the public in May 2005 as its proposed alternative for management of the Lacassine Pool



Prescribed burning of vegetation within the Lacassine Pool and chemical and mechanical means of controlling undesirable upland vegetation will remain the primary tools of choice for vegetation control in and surrounding the pool. Mowing improves vehicle access along the 30 miles of levees in and around the pool. Mowing both sides of the levees will deter woody vegetation encroachment, particularly invasive Chinese tallow trees.

Sediment deposition is a normal process in a freshwater wetland system. Dead plant matter (e.g., detritus) accumulates at the bottom of the impoundment each year. Over time, bottom sediments get closer to the surface and the water-holding capacity of the impoundment diminishes. A research investigation in 2003 sought to determine the thickness of the detritus layer of the pool. Although user-specific variation occurred in the study, an overall average depth was ascertainable. Presumably, under ideal conditions, a 5,000-acre section of the pool could be dewatered fully and dried sufficiently so that a prescribed fire could burn the detritus layer (e.g., peat), reclaim water-holding capabilities, and increase the sustainability of the wetland. A primary objective of the refuge is to establish the capabilities for achieving this end, improving the values of the pool for waterfowl, extending the life of the wetland, while maintaining the pool fishery resource in its current state available for the high numbers of anglers that seek to utilize the pool each spring/summer.

Fishing is the predominant recreational activity on the refuge. Inside the pool, annual visitation for fishing, particularly for largemouth bass, can far exceed use of the refuge by visitors for all other activities (e.g., hunting and wildlife viewing). Improving waterfowl habitat in the pool is the primary management objective. However, the refuge will ensure that all alternatives are considered to improve waterfowl habitat and provide quality recreational fishing. Further partitioning of the pool should improve and/or make feasible dewatering efforts to better manage waterfowl habitat and fishery resources and provide recreational fishing.

Despite numerous constraints, improving the wetland habitat values and extending the longevity of the pool is an extremely important endeavor for habitat conservation purposes. The pool should provide long-term opportunities to enhance wetlands for waterfowl and provide compatible wildlife-dependent outdoor recreation opportunities. See Table 7 for the estimated costs to improve Lacassine Pool.

Table 7. Estimated cost to improve Lacassine Pool

Project Number	Projects	Estimated Costs (Excludes Mandatory Engineering Fees of 17.5 percent of Project Total)
RONS or SAMMS	Title	One-time Costs
	Restoration of Lacassine Pool	\$8,300,000.00
Total		\$8,300,000.00

PROJECT 2 – EARLY SUCCESSIONAL WETLANDS (MOIST-SOIL AND COOPERATIVE FARMING UNITS)

Water levels within early successional wetlands, often called moist soil units by the Service, are manipulated seasonally for two main reasons. First, different groups of birds have different feeding requirements. Dabbling ducks prefer enough water to swim easily but shallow enough to allow bottom feeding. Shorebirds concentrate on mud flats or very shallow water where invertebrates can be readily found. Wading birds utilize shallow water and prefer the deeper borrow ditches along the edges of the impoundments.

Currently, 300 acres are managed as early successional wetland habitat in Unit A; future management of this unit will involve a system of pumps and water control structures to intensively

manage at least four fields annually to maximize production of preferred native plants for waterfowl. A variety of management techniques will be used, including manipulating water levels and soil moisture, discing, burning, mowing, water buffaloeing, and selective herbicide application.

Farming was discontinued in 1981 in Unit C. In 1993, rice was planted in the western portion of the unit and it was managed as a moist-soil unit. In Unit C, re-establishment of water management capabilities and improvements were completed in 2004. Reconditioning much of this unit is needed in order to develop high-quality early successional wetland habitat on at least 300 acres. This would promote high seed-producing annual plants using various management tools.

In Unit E (i.e., School Board Tract), the refuge will work with the Service’s Ecological Services Office and the Corps of Engineers to obtain a permit to set back succession to re-establish moist-soil conditions. It is also the refuge’s goal to secure a long-term agreement with the Cameron Parish School Board, the owners of this tract of land, which better secures the Service’s interests in the land, such as the Wildlife Drive around its circumference.

Estimated costs to expand and enhance moist-soil management units are shown in Table 8.

Table 8. Costs to expand and enhance early successional wetlands’ management units

Project Number	Projects	Estimated Costs (Excludes Mandatory Engineering Fees of 17.5 percent of Project Total)
RONs/SAMMS	Title	One-time
03006	Moist-Soil Management/Farming Implements	\$ 77,000
00005	Decrease Erosion and Protect Important Wetlands	\$150,000
01001	Improve Moist-Soil Management at Unit A	\$ 89,000
03002	Equipment/Implement Storage Shed	\$135,000
04001	Equipment/Backhoe Front End Loader	\$125,000
04002	Chain Link Fence around Maintenance Facility	\$ 39,000
97002	Improve the Farming for Wildlife Program	\$150,000
97013	Improve Refuge Farming Program	\$135,000
97032	Enhance Farming for Wildlife Program	\$121,000
99008	Enhancement of Wading Bird Nesting Habitat	\$121,000
3125675	Rehabilitate Unit A Pumping Station (Pump and Engine)	\$73,000
96101993	Repair Unit A Pump Shed and Fuel Tank	\$26,000
97102013	Rehabilitate 2.25 Miles of Unit B Roads	\$71,000
Total		\$1,312,000.00

Approximately 550 acres in Units B and F will be cooperatively farmed with rice, soybeans, and/or winter wheat to provide foraging opportunities for wintering waterfowl.

Unit B is a 579-acre tract, which is rotated yearly in rice production (approximately 300 acres each year). A cooperative farmer has managed this unit since 1990, by rotating half in rice production and

half in fallow, wheat, or rye grass. The farmer harvests the first crop of rice and leaves the second crop flooded for waterfowl, which works out to be about 20 to 25 percent of the first rice crop.

The refuge acquired the 530-acre tract of land known as Unit F (Coto Plot) in 1996. This unit is managed exactly like Unit B. A cooperative farmer has also managed this unit since 1996.

Costs to expand and enhance cropland units at Lacassine Refuge are shown in Table 9.

Table 9. Costs to expand and enhance cropland units at Lacassine National Wildlife Refuge

Project Number	Projects	Estimated Costs (Excludes Mandatory Engineering Fees of 17.5 percent of Project Total)
RONS	Title	One-time
97002	Improve Farming for Wildlife Program	\$150,000
97013	Improve Refuge Farming Program	\$135,000
97032	Enhance Farming for Wildlife Program	\$121,000
Total		\$406,000.00

PROJECT 3 – UNIMPOUNDED FRESHWATER MARSH

In 1951, the Catfish Locks (i.e., weirs) were completed at the southwest end of Grand Lake across a portion of the original channel of the Mermentau River. These weirs initiated the conversion of all marshes (outside the Lacassine Pool) from brackish to freshwater. Flora and fauna changed significantly as a result. With the change in salinity and loss of hydrological connection to the Gulf of Mexico, the refuge marshes no longer ebbed and flowed as before. This structure, constructed to provide reliable fresh water to benefit agriculture (e.g., rice production), resulted in much more stable water levels in unimpounded marshes within and outside the refuge. Therefore, the “unimpounded freshwater marsh,” described herein but not within control of the refuge, is subject to Army Corps of Engineers’ water level management practices.

Unimpounded freshwater marsh is located in the following fire management units on the refuge: portions of Unit E1 (approximately 200 acres); Unit E2 (2,536 acres); Unit F1 (1,919 acres); Unit F2 (865 acres); and F3 (1,663 acres) all lie adjacent to the Lacassine Bayou, north of the Gulf Intracoastal Waterway; Unit H (2,200 acres) and Unit J (566 acres) lie south of the Gulf Intracoastal Waterway. Unimpounded freshwater marshes described here total approximately 13,173 acres.

Unimpounded freshwater marsh has been the habitat type most impacted by petroleum exploration and transportation on the refuge. The majority of the 82 wells drilled on the refuge have occurred in the ephemeral marshes east of the Lacassine Bayou (particularly Unit F1). As a result of these oil and gas activities, numerous canals were dredged to facilitate access for drilling barges. Spoil banks were subsequently created which converted portions of the marsh to open water (channel) and uplands (spoil banks). Subsequently, the open water has facilitated access into portions of the marsh that would have previously required a mudboat or airboat and it also benefits some waterfowl species. The uplands are the site of greatest concern as they have evolved to now harbor monotypic stands of the invasive Chinese tallow tree, which provides little or no benefit to migratory songbirds,

and are an unnatural component to historic unimpounded freshwater marshes in this area. Invasive Chinese tallow trees quickly out-compete native hardwoods, are much more abundant, and have greatly impacted the openness of the marsh that waterfowl prefer.

The Corps-installed locks and gates in the Mermentau River basin have increased water levels and accelerated land loss in and adjacent to the refuge. Inundated ephemeral marshes, originally prone to flooding and drying events, now remain saturated for extended periods. Soil types present (e.g., silt-like soils) cannot withstand the perpetual wave-, wind-, and human-generated splashing, particularly those coming from large boats. There is evidence, refuge-wide, of the impacts of this traffic (e.g., vertical, sloughing, unstable banks; uprooted trees and vegetation; and aerial photography depicting land loss through time). This evidence, however, would likely be dismissed as largely anecdotal due to poor documentation and no real efforts to pinpoint key sources that have accelerated bank destabilization.

The constant inundation of the unimpounded freshwater marsh, accelerated natural- and human-caused erosion sources, and additional canals through the marsh have created additional hydrological connections between Lacassine Bayou and the Mermentau River. Plans are underway to investigate financial opportunities to re-establish (i.e., rebuild/create) a section of the east bank of Lacassine Bayou, and consider plugging of one or more unneeded canals in the Streeter's area so that further land loss south of the Willow Cutoff (east of Willow Island) can be curtailed. Evidence is now available which demonstrates well that if no actions are taken to reverse the rate of land loss in this area, additional marsh will probably be lost. The seriousness of this issue is paramount and the long-term maintenance of the refuge for the benefit of wintering migratory waterfowl in this area is highly dependent upon the refuge's ability to institute immediate land protection measures.

Lastly, the plight of the refuge as it becomes increasingly invaded with Chinese tallows is extremely alarming. In some areas, the roots of Chinese tallow trees reduce land loss and increase bank stabilization. In other areas, the refuge has taken drastic measures to chemically treat monotypic stands of Chinese tallow, since their presence impacts the ability of native vegetation to colonize. Costs to improve and enhance unimpounded freshwater marsh are shown in Table 10.

Table 10. Costs to improve and enhance unimpounded freshwater marsh

Project Type and Number	Projects	Estimated Costs (Excludes Mandatory Engineering Fees of 17.5 percent of Project Total)
RONs/SAMMS	Title	One-time
00003	Restoration of Abandoned Oil and Gas Production Areas	\$ 86,000
03005	Lacassine Bayou North Washout Area Restoration	\$400,000
97037	Decrease Erosion and Protect Important Wetlands	\$150,000
Total		\$636,000.00

PROJECT 4 – SPECIAL HABITATS: WILDERNESS, PRAIRIE, AND BOTTOMLAND HARDWOODS

In order to adequately conserve, restore, and enhance diverse habitats to provide favorable conditions for migratory birds and terrestrial and aquatic species, a variety of actions specific to each desired habitat should occur and are discussed in the following paragraphs.

Waterfowl habitat values have deteriorated in the Wilderness Area, largely due to closing the area to boat traffic, and the subsequent restriction of water outflow and filling in of boat trails and ponds. In addition, invasive plants, mainly Chinese tallow trees, have become established during drought periods, and need controlling by herbicide application. Prescribed burning is required, emphasizing experimentation on seasonality and frequency to find which combination(s) produce the most favorable results. Also, a bulkhead on the western end of the Pipeline Canal that forms the north boundary should be considered for removal to permit a more natural flow of water out of the marshes.

The Louisiana coastal tall grass prairie ecosystem once encompassed an estimated 3.5 million hectares (8.6 million acres), of which currently only a fraction remains. The Lacassine Refuge prairie of 334 acres is basically restored and is currently a good source for experimentation and seed collection for future prairie restorations. Management techniques, such as prescribed fire (while experimenting with seasonality and frequency), mowing, transplanting, and herbicide application, are used to control invasive species. Mowing or haying may be used where fire is not an option. The Cajun Prairie Habitat Preservation Society currently manages this 334-acre tract under a cooperative agreement.

Lacassine Refuge has only approximately 400 acres of bottomland hardwood habitats found primarily along the Mermentau River, Grand Lake, the Intracoastal Waterway, Lacassine Bayou, and in Lacassine Pool. Chinese tallow trees need to be controlled to prevent further loss of native trees and opportunities need to be investigated to restore bottomland hardwoods and prevent further erosion along the above-mentioned waterways. Lacassine Pool groves are used by nesting wading birds. New cypress groves should be established to increase wading bird nesting sites. Costs to improve special habitats (e.g., wilderness, prairie, and bottomland hardwoods) are shown in Table 11.

Table 11. Costs to improve special habitats, such as wilderness, prairie, and bottomland hardwoods

Project Type and Number	Projects	Estimated Costs (
RONS/SAMMS	Title	One-time
00002	Prepare a Prairie Restoration Handbook	\$ 25,000
99004	Coastal Prairie Restoration Biologist	\$147,000
99014	Prairie Restoration Enhancement	\$ 40,000
Total		\$212,000.00

PROJECT 5 – UNDESIRABLE PLANT AND ANIMAL CONTROL

Non-native species pose problems at Lacassine Refuge, as they do at many national wildlife refuges. Invasive plants cause billions of dollars of damage to our natural and managed ecosystems and agricultural lands. Invasive plants species include the Chinese tallow tree, water hyacinth, hydrilla, common salvinia, phragmites, and alligator weed. Invasive plants will be controlled by discing, prescribed burning, herbicides, flooding, and by other mechanical means.

Trapping and shooting will be used to control nutria (*Myocaster coypus*). Nutria damage levees by burrowing and consume newly planted trees.

Costs to control invasive species are shown in Table 12.

Table 12. Costs to control undesirable plants and animals

Project Type and Number	Projects	Estimated Costs
RONs/SAMMS	Title	One-time
0001	Control Invasive Species	\$150,000
Total		\$150,000.00

PROJECT 6 – INVENTORY AND MONITOR WILDLIFE POPULATIONS AND RESPONSES TO MANAGEMENT ACTIONS

Adaptive management is dependent on having current information on the resource being managed prior to the time management decisions are made. Inventories, surveys, and censuses are methods of providing information on wildlife population trends and health of wildlife resources. Monitoring of habitat also provides managers with information needed to manage wildlife. Performing this basic wildlife management function should be a high priority for the refuge. The refuge will work with universities, the U.S. Geological Survey, and other agencies and partners to establish effective monitoring techniques and statistical analysis of data for decision-making purposes.

The refuge’s biological program needs trained technicians to conduct each of the required activities discussed above. The program should include, at a minimum, one biologist and two bio-technicians. Monitoring protocols and procedures should exist for all biological activities and should be based on scientifically designed methods involving standardized collection procedures.

The first priority of the biological program should be to identify those resources requiring monitoring. Monitoring those resources should direct future management actions (i.e., water drawdowns, fire, water levels, and timing of mechanical treatments) in such a way that the methods are repeatable and suitable for proper evaluation. Computer resources should include field computers, GIS database, and statistical software.

The refuge should consider habitat and population monitoring and evaluation a priority factor in assessing how it is meeting its mission. Staff should develop protocols for sampling habitat and incorporate them into the refuge’s objectives and goals. When budget and staffing allow, the refuge should conduct inventories, surveys, and population assessments of fish, amphibians, reptiles, birds and mammals. National protocols should analyze ecosystem-wide trends.

Costs for this project are shown below in Table 13.

Table 13. Costs to inventory and monitor wildlife populations and responses to adaptive management techniques

Project Type and Number	Projects	Estimated Costs
RONS/SAMMS	Title	One-time
	Supplies, Water Level Monitoring Equipment, Vehicle Fuel	\$21,000
	Waterfowl (Flights, Fuel, Supplies)	\$5,000
	Colonial Nesting Birds (Misc., Fuel)	\$1,000
	Grassland birds (Fuel, Equipment)	\$2,000
	Marsh birds (Misc. Supplies, Fuel)	\$2,000
97036	Develop Oil and Gas Monitoring Program (Biology/CCP)	\$134,000
97040	Expand Refuge Biological Monitoring Programs	\$75,000
97042	Enhance Refuge Management Capabilities Using GIS	\$30,000
Total		\$270,000.00

PROJECT 7– IMPROVE VISITOR SERVICES

Lacassine Refuge can take various steps to improve its visitor facilities. Various projects are identified to make the refuge even more “visitor-friendly” than at present. One of the first priorities of the refuge is to develop an up-to-date step-down management plan for visitor services that includes recommendations for outdoor wildlife-dependent recreation. A means to obtain accurate visitor counts and projected visitation will be developed and included in the visitor services plan.

Presently, the Southwest Louisiana National Wildlife Refuge Complex outreach coordinator provides direction and guidance for visitor services at the refuge. In order for the visitor services program to be more effective, the refuge will need to hire a park ranger. This will allow expansion of the environmental education and public use programs. This employee would be able to provide interpretive talks to visiting students or other groups. Under the direction of the Complex outreach coordinator, the park ranger could supervise volunteers, interact with a Friends Group, and help with other outreach opportunities.

Currently, the entry road to Lacassine Pool is owned by Lacassine Land Company. The refuge has easement rights through this road, including public access. The refuge is responsible for general maintenance and upkeep of the graveled road. This task involves grading and mowing on a regular basis but due to limited staff is a task difficult to tackle. Paving the road would reduce staff maintenance as well as increase public safety.

Standardized highway signs are used to direct visitors to the refuge. Placing Lacassine National Wildlife Refuge on each sign would aid in clarifying the difference between state and federal wildlife areas. There are three routes one can take to get to the refuge, however, only one is signed. Adding signs to the two other routes may increase refuge visitation.

Kiosks, public contact areas, and boardwalks are kept clean and gate areas well mowed. This seems to be a never-ending task, especially in the spring and summer months. An additional full-time maintenance person would alleviate the high demands currently placed on the current staff.

An informational kiosk is needed at the fishing area at the end of Streeter Road. The Streeter Road Public Use area is the only area that remains open year-round to fishing. Currently, refuge visitors can obtain information at the refuge office or from kiosks at Lacassine Pool.

General maintenance of blinds, signs, etc., for the lottery hunt program is necessary. The lottery hunt blinds should be made safer and the crossovers used to access them should be made more accessible.

Parking at the Unit B birding trail is limited to two vehicles posing a safety issue since it is in the curve of Streeter Road. Enlarging the parking area would remedy the safety issue and increase visitor parking. Development of a parking lot and interpretive signs for wood duck and warbler boxes would enhance this trail. The use of interpretive signs would inform the public of how the refuge is performing wildlife management on the refuge, as well as how the visitor could also do such projects in their backyard to benefit wildlife.

Costs to improve visitor services are shown in Table 14.

Table 14. Costs to improve visitor services

Project Type and Number	Projects	Estimated Costs
RONs/SAMMS	TITLE	One-time
03003	Gravel Roads (Public Access/Parking Improvements)	\$ 60,000
03004	Radio Equipment Additions	\$ 45,000
97014	Improve Public Access	\$140,000
97034	Improved Visitor Use Facilities	\$46,000
98003	Improve Environmental Education/Outreach/Public Use Opportunities	\$75,000
98102031	Pave Refuge Headquarters Entrance Road (Route 10; 0.4 mi)	\$118,000
4136178	Rehabilitate Headquarters Front Parking (Route 900)	\$25,000
3125682	Replace Kiosks for Headquarters and Streeter Road Visitors	\$35,000
96101987	Replace Refuge Boundary Signs	\$26,000
3125713	Remove Concrete Wharf (unserviceable boat dock)	\$80,000
1112744	Replace Non-compliant Radio System to Meet Federal Standard and Enhance Safety.	\$68,000
3125716	Replace Interpretive/Directional Signs	\$31,000
98102033	Rehabilitate Deficient Wildlife Drive	\$522,000
Total		\$1,271,000.00

PROJECT 8 – PROMOTE AND ENHANCE PRIORITY PUBLIC USES

A radio message should be developed that would allow visitors to hear about the refuge and its programs and invite them to visit as they pass by.

The addition of a full-time law enforcement officer would dramatically increase law enforcement effectiveness. The current officer is responsible for protecting Lacassine Refuge and other refuges within the Complex.

An additional park ranger would be an asset and hiring one should be a high priority. The Complex outreach coordinator is located at Sabine National Wildlife Refuge, making it difficult to conduct environmental education and interpretive programs at Lacassine Refuge. Current demands are higher than the staff available to fulfill requests for outreach programs in nearby schools and communities.

The environmental education program at Lacassine Refuge could be expanded and improved by using Friends Group, interns, or Student Temporary Employment Program hires to manage the program for a variety of audiences. Development of kits and material, teacher training, and providing kits/materials to the teachers on a check-out basis could be accomplished by hiring an additional park ranger.

The new observation pond boardwalk outside the refuge office provides visitors excellent wildlife observation and photography opportunities. The large oaks near the refuge headquarters are a highlight and unique feature of the refuge. This boardwalk also allows for interpretive signs to tell the story of these “special trees”.

Cost to enhance priority public uses are shown in Table 15.

Table 15. Costs to enhance priority public use

Project Type and Number	Projects	Estimated Costs
RONS/SAMMS	Title	One-time
98003	Improve Environmental Education/Outreach/Public Use	\$75,000
03001	Refuge Law Enforcement/Safety Capabilities	\$85,000
97007	Provide Necessary Law Enforcement Equipment	\$30,000
97026	Improve Refuge Law Enforcement Patrol Capabilities	\$40,000
	Establish Cooperative Education Manager Trainee FTE	\$114,000
4130579	Replace Headquarters Display Pond Boardwalk/Deck	\$26,000
96101990	Rehabilitate Deteriorated Unit A Roads	\$54,000
96101991	Renovate Deficient Unit D Parking Area	\$11,000
98102019	Repair Deficient P&H Fishing Pier Parking Lot	\$49,000
98102025	Rehabilitate Deficient Pool Kiosk Gravel Parking Lot	\$22,000

Project Type and Number	Projects	Estimated Costs
RONs/SAMMS	Title	One-time
98102026	CN Unit A Parking Lot	\$72,000
98102027	Rehabilitate the Deficient Parking Lot at the West Boat Launch	\$90,000
98102034	Rehabilitate Unit B Observation Tower Parking Lot	\$35,000
98102035	Rehabilitate Deteriorated Streeter Road	\$81,000
98102037	Rehabilitate Parking Area at Tidewater Boat Launch	\$77,000
3126121	Rehabilitate Unit A North Road (widen for Safety/Staff and Public Access)	\$230,000
4135720	Rehabilitate Deficient Unit D Observation Tower Parking	\$25,000
4136156	Rehabilitate Lacassine Pool Entrance Road	\$100,000
4136183	Pool Main Kiosk Parking Area	\$25,000
4136192	Rehabilitate Streeter Road	\$200,000
Total		\$1,441,000

PROJECT 9 - PARTNERSHIPS, VOLUNTEERS, FRIENDS, AND INTERNS

The refuge utilizes the services of volunteers, student interns, partners, and members of The Friends of the Lacassine National Wildlife Refuge, as well as the Friends of Southwest Louisiana National Wildlife Refuges and Wetlands, both 503 (c) non-profit organizations. These groups and others assist staff in activities such as management and biological monitoring, studies and research, facility maintenance, and conducting education and outreach programs for schools, civic groups, libraries, and other entities requesting presentations about fish and wildlife (refuge) issues. Partnership opportunities are large but the volunteer base has been limited. The refuge must find ways to improve and increase awareness of these important needs, locate appropriate outlets to advertise opportunities for short-term employment, student projects, scout projects, and better advocate the quantity and types of volunteer activities that are available. In addition, the refuge must maintain and enhance capabilities to house and attract outside assistance.

Many outside organizations and agencies have promoted and supported activities and programs at the refuge. The refuge must continue to foster healthy partnerships with non-profit organizations, universities and schools, parish officials, other elected officials, and civic groups to expand upon the partnerships.

Cost to promote partnership opportunities are shown in Table 16.

Table 16. Costs to enhance priority public use

Project Type and Number	Projects	Estimated Costs
RONs/SAMMS	Title	One-time
0001	Promote Partnerships	\$5,000
Total		\$5,000

FUNDING AND PERSONNEL

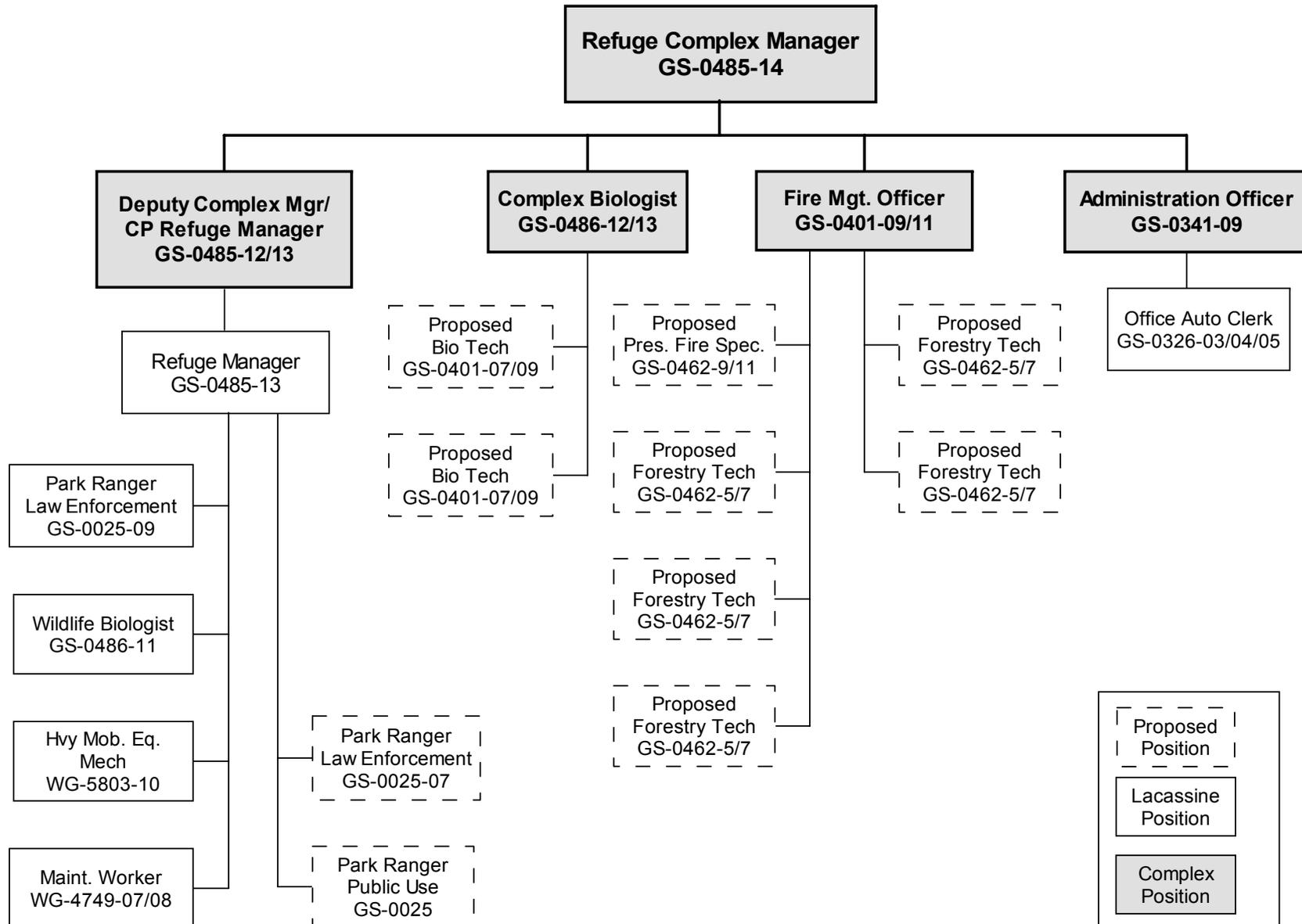
Approved staffing at Lacassine National Wildlife Refuge consists of six full-time positions as shown in Table 17. In early 2004, Lacassine, Cameron Prairie, and Sabine merged into a Complex under the supervision of a GS-14 Project Leader stationed at Cameron Prairie National Wildlife Refuge, the Complex Headquarters.

Additional staffing will be necessary for the refuge to implement the goals, objectives, and strategies identified in this comprehensive conservation plan. Table 17 identifies costs of existing and proposed staffing. Figure 9 is an organization chart of current and proposed staffing for Lacassine National Wildlife Refuge.

Table 17. Cost of existing and proposed positions

Existing Positions	Annual Costs – Existing Positions*
Refuge Manager, GS 13	\$103,000
Heavy Equipment Mechanic, WG 10	\$75,648
Maintenance Worker, WG 8	\$64,397
Refuge Biologist, GS 11	\$71,103
Park Ranger (LE), GS 9	\$64,068
Office Clerk, GS 4	\$37,109
Sub-total – Salary for Existing Positions	\$502,236
Proposed Positions	Annual Costs – Proposed Positions*
Biological Technician, GS 5/7	\$51,597
Biological Technician, GS 5/7	\$51,597
Park Ranger (Law Enforcement), GS 9	\$54,302
Park Ranger (Public Use), GS 7/9	\$54,302
Fire Technicians (5), GS 5/7	\$257,985
Fire Specialist, GS 9/11	\$71,103
Sub-total for proposed positions	\$540,886
Total (Existing and Proposed)	\$1,043,122

Figure 9. Current and proposed staffing for Lacassine National Wildlife Refuge, Southwest Louisiana National Wildlife Refuge Complex



The costs of completing all projects described in this chapter are summarized in Table 18.

Table 18. Summary of Costs for 2006 - 2021

Project Number	Project Title	One-time Costs
1	Freshwater Impounded Marsh (Lacassine Pool)	\$8,300,000
2	Early Successional Wetlands (Moist Soil and Cooperative Farming Units)	\$1,718,000
3	Unimpounded Freshwater Marsh	\$636,000
4	Special Habitats: Wilderness, Prairie and Bottomland Hardwoods	\$212,000
5	Undesirable Plant and Animal Control	\$150,000
6	Inventory and Monitor Wildlife Populations and Responses to Adaptive Management Techniques	\$270,000
7	Improve Visitor Services	\$1,271,000
8	Promote and Enhance Priority Public Uses	\$1,441,000
9	Partnerships, Volunteers, Friends and Interns	\$5,000
	Existing Staff Costs, Refuge – 5.5 FTE's (Based on FY06 salary costs)	\$502,236
	Proposed Staff Costs – 10 FTE's (based on FY06 salary costs)	\$540,886
	Base Operations - Varies	
Total		\$15,046,122

Implementation of projects identified in the proposed alternative would be achieved when possible.

STEP-DOWN MANAGEMENT PLANS

Lacassine Refuge has the following step-down management plans: Alligator Harvest Plan (1993); Annual Water Management Plans (updated yearly); Commercial Trapping Plan (1983); Comprehensive Plan to Resolve Resource Problems (1986); Cooperative Farming Management Plan (1995); Fishery Management (1982); Fishing Plan (1989); Hunting Plan (1984); Oil and Gas Management Plan (1987); Public Use Development Plan (1985); Southwest Louisiana Lease Areas Management Plan; Vidrine Farm Service Agency (formerly Farmers Home Administration) Fee Title Management Plan (1993); and Wilderness Management Plan (1985). Table 19 lists plans that need to be revised or written and proposed completion dates.

Table 19. Step-down management plans

Plan Name	Fiscal Year Proposed Completion/Revision Date
Alligator Harvest	2013
Cooperative Farming	2014
Cultural Resources	2020
Exotic Species	2013
Fire Management/Fire Effects Monitoring	2005
Fisheries Management	2015
Hunting	2012
Law Enforcement	2008
Oil and Gas Management	2015
Sport Fishing	2012
Visitor Services Management	2012
Volunteers, Friends, and Partnerships	2011
Water Management	Annual
Wilderness	2010

PARTNERSHIP OPPORTUNITIES

Lacassine National Wildlife Refuge has historically partnered with many others to improve management of the refuge. It is anticipated that these partnerships will continue and opportunities to develop additional partnerships will be pursued. Partnerships are very important to the refuge to achieve its goals, objectives, and strategies, leverage funds, minimize costs, and bridge relationships with others.

Presently, the refuge has cooperated with the Louisiana Department of Fisheries and Wildlife, Louisiana Department of Natural Resources, Louisiana Department of Transportation and Development, U.S. Army Corps of Engineers, U.S. Geological Survey Wetlands Research Center, National Resources Conservation Service, National Oceanic and Atmospheric Administration, North American Wetlands Conservation Council, City of Lake Charles, Lake Charles Visitors and Convention Bureau, Cameron Parish Police Jury, Creole Nature Trail, Miami Corporation, Sweet Lake Land and Oil, McNeese State University, Louisiana State University, Ducks Unlimited, Coastal Prairie Conservancy, and Texas Parks and Wildlife.

The refuge also has a significant partner in its Friends Group – the Friends of Lacassine National Wildlife Refuge, Inc., which was founded in 1999. The Friends Group has hosted several Migration Sensation Festivals in consecutive years. This Friends Group, as well as the newly formed Southwest Louisiana Refuge Complex Friends Group, can play an even greater role in the future by emphasizing environmental education and other visitor service activities that raise public awareness. These groups may also assist in refuge efforts for facility development, improving interpretation and environmental education programs, and improving maintenance of public use areas, such as trails and fishing areas. Lacassine Refuge will also be striving to initiate a more active volunteer program.

MONITORING AND ADAPTIVE MANAGEMENT

The goals and objectives found in this comprehensive conservation plan have designated various strategies that will improve the refuge's capability to apply adaptive management techniques and monitor the success of management actions. Monitoring is critical to successful implementation of this plan and is necessary to evaluate the progress toward achieving objectives and to determine if refuge conditions are changing.

PLAN PERFORMANCE

This plan will be reviewed annually to determine if any revisions are necessary. Priorities will be assessed. Step-down management plans will be developed to address completion of strategies that support goals and objectives. Any revision or major variances to this plan would be carried out under policies set forth in the National Environmental Policy Act of 1969, and would include opportunities for public review. A new plan is required after 15 years.

Annual narratives will contain documentation of successful implementation of the goals, objectives, and strategies within the plan. Various means to inform the public of accomplishments may also be carried out through news releases, newsletters, and personal communications.

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Pre-planning for this comprehensive conservation plan began in early 2002, when Biological and Public Use Reviews of Lacassine National Wildlife Refuge were conducted. Experts and specialists submitted recommendations for future management. These recommendations were used extensively during the development of this plan. Contributors include:

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SECTION B. ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

This Environmental Assessment for Lacassine National Wildlife Refuge has been prepared in compliance with the National Environmental Policy Act. It discusses the purpose and need for the comprehensive conservation plan for the refuge, which is in Cameron and Evangeline Parishes, Louisiana. It provides an analysis of the environmental impacts that could be expected from each of the management proposals. This analysis assists the Fish and Wildlife Service in determining if it will need to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) for the refuge's proposed comprehensive conservation plan.

The U.S. Fish and Wildlife Service is the nation's primary conservation agency concerned with the protection and long-term management of wildlife resources. The Service administers the National Wildlife Refuge System, a system of more than 545 national wildlife refuges embracing over 95 million acres, much of which is primarily managed for the enhancement of migratory bird populations and federally listed threatened and endangered fish, wildlife, and plants. Of particular concern in the Lower Mississippi Valley Ecosystem and the adjacent Texas Gulf Coast Ecosystem is the plight of migratory bird populations—migratory waterfowl and shorebirds, as well as neotropical migratory songbirds—and the loss of coastal marshland from both natural and human causes. As a result, the Service is emphasizing the maintenance and restoration of coastal wetlands and healthy bird populations in the proposed management plan for Lacassine National Wildlife Refuge.

PURPOSE AND NEED FOR ACTION

The purpose of the comprehensive conservation plan and environmental assessment is to establish and implement management direction for Lacassine National Wildlife Refuge for the next 15 years.

The environmental assessment is needed to set forth and evaluate a range of reasonable management alternatives for the refuge. Each alternative was generated with the potential to be fully developed into a final comprehensive conservation plan and to describe the predicted biological, physical, social, and economic impacts of implementing each alternative. The Fish and Wildlife Service will select an alternative to be fully developed for this refuge.

The Service identified issues, concerns, and needs through discussions with the public, agency managers, conservation partners, and others. In particular, the Service's planning team identified a range of alternatives, evaluated the possible consequences of implementing each, and selected Alternative B as the proposed management action. In the opinion of the Service and the planning team, Alternative B is the best approach to guide the refuge's direction.

There is no current plan that identifies priorities and ensures consistent and integrated management of the refuge, thus necessitating the need for this plan. The National Wildlife Refuge System Improvement Act of 1997 requires that all national wildlife refuges have a comprehensive conservation plan in place within 15 years.

DECISIONS TO BE MADE

Based on the assessment described in this document, the Fish and Wildlife Service will select an alternative to implement the Final Comprehensive Conservation Plan for Lacassine National Wildlife Refuge. A FONSI is a statement explaining why the selected alternative will not have a significant effect on the quality of the human environment. This determination is based on an evaluation of the Service and refuge system mission, the purpose(s) for which the refuge was established, and other legal mandates. Assuming no significant impact is found, implementation of the plan will begin and will be monitored annually and revised when necessary.

PLANNING STUDY AREA

Lacassine National Wildlife Refuge was established on December 30, 1937, as Lacassine Migratory Waterfowl Refuge by the following: 1) Executive Order 7780, "...as a Refuge and breeding ground for migratory birds and other wildlife...;" 2) the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or any other management purpose, for migratory birds," (USC 715d); and 3) the Fish and Wildlife Act of 1956 "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 USC 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services" [16 USC 742f(b)(1)].

Lacassine Refuge is located at the edge of Grand Lake and 15 miles from the Gulf of Mexico in Cameron and Evangeline Parishes in southwestern Louisiana. It is strategically located on the boundary between coastal marsh and agricultural habitats, as well as at the southern terminus of the Mississippi and Central Flyways, making the refuge critically important to migratory birds, especially wintering waterfowl.

Most of the 34,724-acre refuge consists of freshwater marsh with only a few natural ridges and levees. The dominant feature of the refuge is Lacassine Pool, created sixty years ago by enclosing a 16,000-acre marsh with a low levee. The refuge is bisected from east to west by the Gulf Intracoastal Waterway and north to south by Lacassine Bayou. Habitat types and approximate acreage on the refuge include 14,700 acres of fresh marsh, 16,000 acres of impounded fresh marsh, 1,048 acres of open water, 352 acres of forested wetlands, 348 acres of shrub wetlands, 1,109 acres of croplands (e.g., rice and fallow), 307 acres of managed fresh marsh (e.g., moist-soil plant impoundments), and 334 acres of coastal prairie plus roads, levees, etc. About 3,300 acres south of the Gulf Intracoastal Waterway are formally designated as a Wilderness Area.

The vegetative types occurring on the refuge are primarily water-tolerant grasses, sedges, and shrubs. The types vary according to the frequency, depth, and length of time water covers the area. Vegetation in the undeveloped marshes is predominantly bulltongue. Vegetation in Lacassine Pool consists primarily of bulltongue, maidencane, watershield, waterlily, spikerush, and southern bulrush.

Lacassine Refuge's marshes provide valuable habitat for resident and migratory populations of ducks, geese, shorebirds, wading birds, swamp rabbit, armadillos, and alligators, among other wildlife. Every winter, the refuge hosts many thousands of waterfowl flying south for the season from snow-covered, frozen northern breeding grounds. Lacassine Pool acts as a daytime sanctuary for waterfowl, with large concentration of birds flying out to feed at sunset and returning by dawn. Large wintering concentration of white-fronted and snow geese can be found here along with ducks, such as pintails, blue-winged and green-winged teals, mallards, ring-necked ducks, gadwalls, shovelers, and American widgeons.

Refuge habitat is managed for all wildlife, with particular emphasis on waterfowl. Management techniques used at Lacassine Refuge include prescribed burning, managing for moist-soil plants, planting food crops and water level manipulation. Approximately 2,129 acres are managed for moist soil plants and agricultural crops to provide desirable waterfowl food. The refuge also uses several management techniques to provide suitable conditions for waterfowl within Lacassine Pool, which is undergoing succession and filling in as organic matter accumulates on the bottom, reducing the pool's depth and water volume.

Lacassine Refuge has been divided into management units, both impounded (Units A, B, C, D, E1, F3, and G) and unimpounded (Units E2, F1, F2, H, I, and J).

Lacassine Refuge is part of the Southwest Louisiana National Wildlife Refuge Complex, which also includes Cameron Prairie and Sabine National Wildlife Refuges to the west within Cameron Parish and Shell Keys National Wildlife Refuge in offshore waters in Iberia Parish. While these four refuges within the Complex share certain staff and coordinate on a good deal of planning and management activities, this environmental assessment, and the comprehensive conservation plan it covers, focuses only on Lacassine National Wildlife Refuge.

COMPREHENSIVE CONSERVATION PLANNING PROCESS AND ISSUE IDENTIFICATION

A mailing list of organizations and individuals was compiled to ensure that the refuge was contacting a wide array of "stakeholders," including interested people; users like hunters, bird watchers, and anglers; and agencies representing tribes, the State of Louisiana, and local jurisdictions. A series of open houses and scoping meetings were held in 2003, 2004, 2005, and 2006 at various convenient locations in several communities throughout the area. These scoping meetings covered comprehensive conservation planning occurring simultaneously at Cameron Prairie, Sabine, and Lacassine Refuges, and attendees were invited to register their comments, input, observations, and preferences on any or all of the three refuges.

Announcements giving the location, date, and time for the first scoping meeting appeared in local newspapers and were furnished to local residents. Input obtained from the scoping meeting and discussions held with state and local officials, civic groups, and conservation organizations were used to develop the draft plan. Because of the issues and conflicts raised by intensive public use of Lacassine Pool, there were more comments on Lacassine Refuge at these meetings than there were on Sabine and Cameron Prairie Refuges. The Service conducted a focus group meeting in September 2003, in Lake Charles, specifically to address issues surrounding fishing in Lacassine Pool and two more meetings in 2005 and 2006.

Beginning with the preparation of the draft plan, the planning team developed a list of issues and concerns likely to be associated with the management of the refuge. These issues and concerns were expanded to include those ideas generated by citizens from the local community. Refuge staff contacted local civic groups, as well as federal, tribal, state, and local agency representatives to gather additional issues and concerns and to respond to preliminary alternatives developed by the planning team in 2003-2004.

Together with refuge goals, key issues, and a range of management options, a basis was formed for the development and comparison of the management alternatives described in this document. Comments received from the internal agency review, open house, and other responses from the public will be forthcoming following review of this draft plan and environmental assessment, and will assist the Service in refining the range of alternatives described in this section, especially the proposed alternative. Several significant key issues or problems formed the basis for the development and comparison of the different alternatives described in Chapter II of this environmental assessment.

II. Alternatives

FORMULATION OF ALTERNATIVES

After conducting internal and external scoping, the planning team developed six broad goals for Lacassine Refuge, the pursuit of which would help realize its purpose and vision. These goals apply to each of the alternatives described below.

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the refuge purpose, vision, and the goals identified in the comprehensive conservation plan; the priorities and goals of the Lower Mississippi Valley Ecosystem Team; the goals of the National Wildlife Refuge System; and the mission of the Fish and Wildlife Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service and the public during public scoping.

The three alternatives identified and evaluated represent different approaches to provide permanent protection and restoration of fish, wildlife, plants, habitats, and other resources at Lacassine Refuge.

The planning team assessed biological conditions and analyzed external relationships affecting the refuge. This information contributed to the development of goals and objectives and, in turn, alternative formulation. As a result, each alternative presents different sets of objectives and strategies for reaching long-term goals. Each alternative was evaluated based on how much progress it will make and how it will address core habitat issues, problems, and wildlife threats.

Problems and threats, which can also be expressed as issues, concerns and opportunities, provide important perspective and guidance in developing alternatives. Trends in habitat and wildlife uses were evaluated, as was the capability of refuge habitat to support these uses.

Overall, the greatest risk to fish, wildlife, plants, and wildlife habitats in the Chenier Plain of the Gulf Coast Ecosystem is from extensive wetland habitat degradation and loss that has occurred over the past century. Louisiana has the highest rate of wetland loss of any state in the nation, approximately 23.9 square miles per year or 41.92 acres per day, for the 1990 to 2000 time period (Barras et al. 2003), accounting for 80 percent of the national total (Esslinger and Wilson 2001). Marsh loss in the Mermentau River Basin is projected to be over 1,000 acres per year (0.23 percent per year) or 62,000 acres by 2050 (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). Wetlands in the Chenier Plain declined 16 percent from the mid-1960s to 1990, and marsh is expected to be reduced by another 14 percent from 1900 to 2050 (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). These habitat losses have led to commensurate impacts on wildlife populations, especially on those species dependent on wetlands. As a result, the Service has identified wetland conservation and restoration as the most important wildlife priority in the Gulf Coast Ecosystem.

DESCRIPTION OF ALTERNATIVES

Serving as a basis for each alternative, sets of objectives were developed by the planning team that lead to the fulfillment of the refuge purpose and the National Wildlife Refuge System mission. Objectives are desired conditions or outcomes that are grouped into sets and for this planning effort, consolidated into three alternatives. These alternatives, overall, represent a range of different management treatments, approaches, or priorities for managing the refuge over a 15-year time

frame. The three preliminary alternatives are summarized below. Following the summary descriptions is a table that depicts the objectives formulated for each alternative.

ALTERNATIVE A – NO ACTION (CURRENT MANAGEMENT DIRECTION)

Under Alternative A, the “no action” alternative, management on Lacassine National Wildlife Refuge would not change from current management. The refuge would remain at 34,724 acres in fee title (including Farm Service Agency transfer lands), and leased land (652-acre Cameron Parish school section). With “no action,” marsh loss rates of at least 0.23 percent per year would continue to be low-to-moderate in the Mermentau River Basin; similar rates are expected in Lacassine National Wildlife Refuge.

The refuge would continue to manage impounded freshwater marsh (16,000 acres), dynamic state-jurisdictional waterways (Lacassine Bayou and Mermentau River), ephemeral freshwater marsh (Streeter Canal, Duck Pond), and manage upland vegetation to benefit native plants. Acreages of different habitats would remain as they are now:

- 14,700 acres of unimpounded fresh marsh
- 16,000 acres of impounded fresh marsh
- 1,048 acres of open water
- 352 acres of forested wetlands
- 348 acres of shrub wetlands
- 1,109 acres of croplands (rice and fallow)
- 307 acres of managed fresh marsh (moist-soil plant impoundments)
- 334 acres of coastal prairie plus roads and levees

About 3,300 acres south of the Gulf Intracoastal Waterway would continue to be formally designated as wilderness.

Management focus at Lacassine Refuge would be on biological monitoring, wildlife management, invasive plant management, moist soil management, cooperative farming program management, public use/ environmental education, and priority public use management (e.g., hunting and fishing).

ALTERNATIVE B – PROPOSED ACTION (MAXIMIZE REFUGE MANAGEMENT CAPABILITIES IN ALL PROGRAMS)

Under Alternative B, the proposed alternative, Lacassine National Wildlife Refuge would fulfill its approved acquisition boundary. The 3,300-acre Wilderness Area would remain the same size. Gross habitat acreages would not change appreciably from those under Alternative A, but habitats in general would be managed more intensively.

The refuge would also expand on existing wildlife management programs including:

1. Focus refuge management on improving/extending the value of the Lacassine Pool as a waterfowl sanctuary through adaptive management and increased emphasis on research;
2. Provide additional waterfowl food by increasing moist-soil acreage from 300 to 750 acres and expanding on the farming program;
3. Pursue opportunities to reduce erosion to refuge marshes caused by commercial navigation, wind/wave action, other natural forces, and oil and gas industry traffic/activities;

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4. Conduct/evaluate prescribed fire in Lacassine Pool and other refuge marshes to enhance habitat for migratory birds, fish, and other wildlife.
 5. Seek support to control invasive plants in Wilderness Area and refuge-wide using approved minimum tools;
 6. Continue partnerships to manage and protect the 334-acre coastal prairie, locally known as Cajun prairie, on the Duralde Unit;
 7. Improve hunting/fishing experiences;
 8. Maintain current level of outreach and environmental education programs.
 9. Manage oil and gas activities in accordance with Service policy (Refer to Section A, Chapter II, Refuge Related Problems, Oil and Gas Activities).

Under this alternative, levees would be constructed within Lacassine Pool, subdividing it into four units (Unit D plus three additional units). This action would facilitate the management and lengthen the longevity of the pool by increasing the ability of refuge staff to dewater it, drawing it down to facilitate oxidation of accumulating sediments and more frequent use of prescribed fire. Thus, management could proceed unit-by-unit on a regular basis without having to impact the value of the entire pool to migratory birds and fisheries all at once.

ALTERNATIVE C — SECONDARY ACTION ALTERNATIVE (MAXIMIZE HABITAT QUANTITY/QUALITY FOR WINTERING WATERFOWL FOCUSING ON LACASSINE POOL ONLY)

Under Alternative C, the secondary action alternative, the Lacassine National Wildlife Refuge would remain at 34,724 acres but would refocus the refuge management priority to actively investigating and extending the life/value of the Lacassine Pool freshwater impoundment, which serves as a migratory waterfowl sanctuary October 15-March 15 annually.

Due to sedimentation rates and constraints on water-level management capabilities, Lacassine Pool's lifespan is limited and, if nothing is done, it would gradually lose its value to both migratory waterfowl and fish populations, eventually becoming a wet meadow rather than a marshy wetland characterized by a mix of open water and emergent vegetation.

Under Alternative C, the refuge would investigate and finalize a strategy to extend the lifespan of the Lacassine Pool, which is 16,000 acres in size and remains the core responsibility of the refuge. Other programs dealing either with non-pool areas of the refuge or non-habitat aspects of refuge management (i.e., cooperative farming, moist-soil management, upland vegetation management, visitor services, and priority public uses) would be managed at a reduced level since finite refuge resources would be directed to the Lacassine Pool.

Under this alternative, levees would be constructed within Lacassine Pool, subdividing it into six units over the next 10-15 years. This action would facilitate the management and lengthen the longevity of the pool by increasing the ability of refuge staff to dewater it, drawing it down to facilitate oxidation of accumulating sediments and more frequent use of prescribed fire. Thus, management could proceed unit-by-unit on a regular basis without having to impact the value of the entire pool to fisheries and migratory birds all at once.

COMPARISON OF ALTERNATIVES

Each of the three alternatives outlined above would pursue the refuge purpose, mission, vision, and management goals. However, each represents a different approach to doing so; while there are certainly overlaps between the three, each alternative has its own emphases and priorities, as well as tradeoffs, toward land management, conservation, and public use.

Each of the three would be consistent with the following: Partners-in-Flight Plan; North American Waterfowl Management Plan; Lower Mississippi Valley Joint Venture; Chenier Plain Initiative of the Gulf Coast Joint Venture; Endangered Species Act; National Wildlife Refuge System Improvement Act, Migratory Bird Conservation Act; and mission and goals of the National Wildlife Refuge System. Alternative B would achieve more in approaching the intent of these plans and statutes, but it would also cost more to implement than Alternative A. Alternative C would be considered consistent with the intent of the above plans and statutes, but instead of spreading staffing and budgetary resources around the entire refuge, it would focus those resources on the refuge's core area – Lacassine Pool.

Table 20 identifies and compares management actions as a means of responding to the issues raised by Service managers and the public. These management actions were summarized into the three alternatives described above to accomplish the refuge system mission, the authorized purposes of the refuge, and to address significant threats, problems, and issues raised by public agencies and private citizens.

Table 20. Comparison of objectives by management alternative

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
Goal A – Habitat Management: Conserve, restore, and enhance diverse habitats to provide favorable conditions for migratory birds and native terrestrial and aquatic species.		
Objective A-1: Management of Impounded Freshwater Marsh (Lacassine Pool)		
<p>Allow the pool to continue to shift towards a 100:0 ratio of emergent vegetation to open water, with plants of low-to-medium food value and with extensive beds of submerged aquatic vegetation, so as to provide roosting habitat and sanctuary from disturbance for migratory birds, fish, and other wildlife resources compatible with the purposes of the refuge.</p>	<p>Manage the pool to achieve a habitat mosaic in an approximate emergent vegetation to open water ratio of 50:50, with plants of high waterfowl food value and extensive beds of submerged aquatic vegetation, so as to provide roosting and foraging habitat and sanctuary from disturbance for migratory birds, fish, and other wildlife resources compatible with the purposes of the refuge.</p>	<p>Manage the pool to achieve a habitat mosaic in an approximate emergent vegetation to open water ratio of 50:50, with plants of high waterfowl food value and extensive beds of submerged aquatic vegetation, so as to provide roosting and foraging habitat and sanctuary from disturbance for migratory birds, fish, and other wildlife resources compatible with the purpose of the refuge.</p>
<p>Strategies</p> <p>Employ strategies (a) through (f) from Alternative B.</p>	<p>Strategies</p> <p>(a) Continue repairing and maintaining all spillways and leaking levees.</p> <p>(b) Operate the spillway structures to accommodate a pool level that benefits migratory birds and takes into consideration fish, other wildlife, and access for recreational fishing.</p> <p>(c) Conduct prescribed/hazardous fuel removal burns as environmental factors permit. Secure advanced permission from appropriate decision-makers to conduct prescribed burns during severe fire danger periods.</p> <p>(d) Pool elevations would be surveyed to allow for subsidence and the resetting of spillway structure gages and stop logs.</p> <p>(e) Rehabilitate and maintain a deepwater perimeter ditch around the interior perimeter of the pool.</p> <p>(f) Continue to stock fish as needed and continue to collect fisheries and waterfowl use data.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B, except that Lacassine Pool would be subdivided into 6 interconnected units of varying size.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(g) Subdivide the pool into three additional management units (Unit D, plus three units). The first phase would be accomplished by separating the southeast 5,000-acre-unit and replacing the two existing water passageways with two new water control structures with boat passage gates, the placement of a mobile water pumping unit, and the removal of any interconnecting culverts so that the unit will have the capability to be fully isolated from the remaining 11,000-acre-unit while it is being restored. The southeast unit would be treated in accordance with strategies identified in Objective A-1. The next phase, installation of an additional dike across the remaining 11,000-acre-unit with associated infrastructure, would occur as soon as resources are available. While the first phase is being completed, the remaining 11,000-acre unit would be managed using the strategies identified in Objective A-1.</p> <p>Studies</p> <p>Concurrently with the preceding actions, the Service would conduct a feasibility study as follows:</p> <p>(h) Conduct a feasibility study focused at the removal of dead plant vegetation that has accumulated over the last 60 years through a private entity that can sell the material as top soil or peat on the open market. The study should also investigate the feasibility of mechanically removing floating aquatic vegetation with the best available technology. The study would determine what the permitting requirements would be and if it could be a financially and environmentally viable project. If the project proved viable, it would be implemented.</p> <p>Treatment of individual management units once constructed</p> <p>Each unit would be treated using the following strategies:</p>	

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(1) Within a 10-year period, but not to exceed 15 years, draw one unit completely down during the spring to allow for oxidation. Conduct a prescribed burn to set back natural succession and dispose of accumulated dead plant material. Continue fuel reduction material burns as needed but conduct burns during the summer months whenever possible. Drawdown of the unit may require multiple years to achieve management goals.</p> <p>(2) Obtain advance permission to conduct prescribed burns during severe fire danger conditions. Keep annual records of fire practices and have prescription plans prepared to take advantage of drought periods.</p> <p>(3) Provide water control structures and water pumping devices as needed to maintain the maximum water management capability possible.</p> <p>(4) Develop an adaptive water management plan for each unit as it is rehabilitated that benefits migratory birds and takes into consideration fish, other wildlife, and recreational fishing. The plan should include:</p> <ul style="list-style-type: none"> • Development and maintenance of an elevation profile throughout the pool to determine depths to mineral soil, depth of organic matter, and pool contours. • Installation of water level gauges at strategic points in the pool to allow recording of pool water elevations and drawdown schedules. • Review of the water quality sampling plan to re-establish sampling objectives and procedures that would be sensitive to significant changes (i.e., immediate or long-term) inside and outside the pool. 	

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<ul style="list-style-type: none"> • Acquisition and updating of aerial imagery, ground surveys, and sound sampling procedures to track vegetation communities and open water/vegetation ratios and trends at 5- to 8-year intervals (work with USGS to type map pool vegetation communities and repeat every 5-8 years). • Monitor changes in the pool by utilizing fine-scale plant/habitat aerial imagery inventory methods to type map habitats, with an emphasis on identifying aquatic-plant types, ratios of open water to vegetation coverage, and comparisons of vegetation/water ratio trends over a 5-year time period. • Determine vegetation/water ratio changes associated with years following major hurricane events and any introduction of higher salinity waters. <p>(5) The remaining units awaiting their initial sediment treatment would continue to be open to fishing. Water levels would continue to be managed in a manner that is conducive to migratory birds, and, to the extent possible, a fisheries resource and recreational fishing.</p> <p>(6) Inform the public through refuge brochures (e.g., fishing and hunting) and at kiosks that the primary purpose of the refuge is migratory bird management. The message should state that measures taken to improve migratory bird habitat are also expected to benefit fish populations and anglers by prolonging the life of the pool.</p> <p>(7) Archive all previous and future management treatments and scientific/biological studies, data relating to management actions/results, vegetation maps, and impacts of</p>	

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>catastrophic events (e.g., hurricanes and droughts) in one file or binder for future reference.</p> <p>(8) Continue the historical waterfowl sanctuary status of the pool for migratory birds, especially waterfowl, and limit human disturbances by restricting and closely regulating public use of the pool itself and its observation route from October through March; by controlling oil and gas exploration and development; and by locating and protecting rookeries.</p> <p>(9) Use mechanized equipment wherever practicable to build fish passageways and deep ponds so that fish would have escape routes to deeper water during droughts or cyclic drawdowns.</p> <p>(10) Restock the fisheries resource as needed.</p> <p>(11) Provide additional boat launching sites.</p> <p>Unit D management</p> <p>(i) Keep the 714-acre Unit D, established as an experimental research unit, separated from the pool.</p> <p>(1) Work with the Louisiana Department of Wildlife and Fisheries and Fish and Wildlife Service fisheries biologists to manage the area as a special waterfowl and fisheries management area.</p> <p>(2) Explore the feasibility of imposing special fishing regulations in Unit D that may favor longer-living centrarchids and, if practicable, implement the initiative.</p> <p>(3) Explore providing some form of limited horsepower boating access to the area under a time and space management program. If it is determined that this is feasible, implement the access.</p> <p>(4) Habitat management of this individual unit would follow the same general</p>	

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>management guidelines as identified for the pool units.</p> <p>Gulf Intracoastal Waterway</p> <p>(j) Closely monitor and document the effects of shipping traffic on the south dike of the Lacassine Pool, which is adjacent to the Gulf Intracoastal Waterway.</p> <p>(k) Implement an engineering study within five years to determine what preventive action needs to be taken to avoid erosion potentially being caused by vessels using the Gulf Intracoastal Waterway</p>	
Objective A-2: Unimpounded Freshwater Marsh		
<p>Under current passive management, Willow Cutoff will continue to slowly erode, with declining waterfowl value, reduced water quality, and soil and marsh loss.</p>	<p>By 2015, reestablish the shoreline of Willow Cutoff to improve water quality, eliminate further erosion, and restore natural marsh conditions.</p>	<p>Under proposed passive management, Willow Cutoff would continue to slowly erode, with declining waterfowl value, reduced water quality, and soil and marsh loss.</p>
<p>Strategies</p> <p>(a) Monitor long-term changes in water quality, marsh, and waterfowl use of Lacassine Bayou.</p>	<p>Strategies</p> <p>(a) By 2017, prepare a feasibility study and, if appropriate, a restoration plan for the marshes adjacent to Lacassine Bayou based on hydrologic modeling and possibly using terraces as a means to improve water quality and either restore marsh or sub-merged aquatics. Consider carrying out this project as a mitigation project.</p>	<p>Strategies</p> <p>(a) Monitor long-term changes in water quality, marsh, and waterfowl use of Lacassine Bayou.</p>
Objective A-3: Early Successional Wetlands		
<p>Maintain 307 acres in early successional wetlands on Unit A to provide shallow water and emergent wetland plant species for waterfowl, shorebirds, secretive marsh birds, and wading birds.</p>	<p>Establish adaptive management capabilities on up to 750 acres in Units A, C, and possibly E to provide shallow water and emergent wetland plant species for waterfowl, shorebirds, secretive marsh birds, and wading birds.</p>	<p>Maintain 307 acres in early successional wetlands on Unit A to provide shallow water and emergent wetland plant species for waterfowl, shorebirds, secretive marsh birds, and wading birds.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>Strategies</p> <p>Employ same strategies as Alternative B except for (e), (f), and (i).</p>	<p>Strategies</p> <p>a) Early successional wetlands would be maintained in early successional native plant communities for the production of annual seed crops.</p> <p>(b) Provide early successional wetlands from mid-August through October for early migrating waterfowl and shorebirds.</p> <p>(c) Provide early successional wetland habitat from November through March for wintering waterfowl.</p> <p>(d) In Unit A, develop a system of pumps and water control structures to intensively manage at least four fields annually to maximize production of native plants recognized as preferred waterfowl food. Use various management tools, including manipulating water levels and soil moisture, discing, burning, mowing, water buffaloing, and selective herbicide application.</p> <p>(e) In Unit C, re-establish water management capability and improve and recondition much of this unit (except the rookery area) in an effort to develop high-quality early successional wetland habitat on at least 300 acres by improving water management capabilities (e.g., improved structures and pumps). Promote high seed-producing annual plants using various management tools.</p> <p>(f) Consider further subdividing Unit C to achieve the capabilities needed to successfully manage early successional wetland plants.</p> <p>(g) Plan, monitor, and document plant and wildlife responses to early successional wetland management actions by unit utilizing standardized techniques and refuge-wide sampling techniques.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B except for (e), (f), and (i).</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(h) Install water level gauges on all early successional wetlands (e.g., moist-soil units).</p> <p>(i) Manage for early successional wetland plants in Unit E.</p>	
Objective A-4: Coastal Prairie		
<p>Assist partners in maintaining and restoring approximately 400-500 acres of coastal prairie habitat and conserving prairie plant seed sources at the Duralde Prairie (also called Vidrine Tract) and other sites for the benefit of grassland birds and to contribute to the priorities of the Texas Gulf Coast Ecosystem and the Lower Mississippi River Ecosystem.</p>	<p>Work with partners to maintain and restore approximately 1,000 acres of coastal prairie habitat and conserve prairie plant seed sources at the Duralde Prairie (also called Vidrine Tract) and other sites for the benefit of grassland birds and to contribute to the priorities of the Texas Gulf Coast Ecosystem and the Lower Mississippi River Ecosystem.</p>	<p>Maintain current habitat conditions on existing refuge prairie at the Duralde Prairie (also called Vidrine Tract) for the benefit of grassland birds and to contribute to the priorities of the Texas Gulf Coast Ecosystem and the Lower Mississippi River Ecosystem.</p>
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Use management tools, such as fire, mowing, transplanting, overseeding and postseeding introduction of additional plant species, and selective herbicide application, to accomplish this objective. Mowing or haying (i.e., where clippings are removed) may be used in areas where fire is not an option.</p> <p>(b) Work with partners to establish a long-term monitoring plan using standardized protocol(s) (e.g., Project Prairie Bird) to measure grassland bird use and adapt management to achieve high-quality prairie habitat.</p> <p>(c) Make several small prairie plantings, each from a different prairie remnant and each isolated genetically from one another (i.e., at least 1 mile between sites), to serve as diverse seed sources.</p> <p>(d) Restore additional coastal prairie, ideally in blocks of one to several hundred acres to support winter grassland birds and, ultimately, one large block of 10,000 acres, assuming that propagules and operation and</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	maintenance support are available when needed to provide habitat for area-sensitive species.	
Objective A-5: Croplands		
Maintain approximately 550 acres in Units B and F annually in cooperatively farmed crops, such as rice, soybeans, and winter wheat, to provide foraging opportunities for wintering waterfowl.	Maintain approximately 550 acres in Units B and F annually in cooperatively farmed crops, such as rice, soybeans, and winter wheat, to provide foraging opportunities for wintering waterfowl.	Maintain approximately 550 acres in Units B and F annually in cooperatively farmed crops, such as rice, soybeans, and winter wheat, to provide foraging opportunities for wintering waterfowl.
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Maintain the current farm agreement, which requires the farmer to leave the second crop unharvested, providing a large volume of quality food for wintering waterfowl.</p> <p>(b) Management of fallow rice fields should be modified to provide improved foraging habitat for wintering waterfowl by allowing seed maturation of weeds before discing.</p> <p>(c) When managing fallow cropland for shorebirds, alter drawdown schedules to provide shallow water/mudflats from late-March until early-May and from mid-August through October. Work with cooperative farmers to limit discing from August 1 through September 30, and to provide water depth suitable for shorebird use.</p> <p>(d) As a part of the normal manipulation of early successional wetland habitat in Unit A, the refuge should annually produce about 70 acres of rice, or other grain, that would be left for wintering waterfowl.</p> <p>(e) If cooperative farming is lost as an available management option, contract farming or force account farming should always be considered on a minimum of 300 acres of rice production.</p> <p>(f) If current farm practices in southwest Louisiana cause significant reductions in</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>wintering waterfowl foraging habitat capacities on private lands (e.g., a significant reduction in the rice acreage), the refuge should work to offset those losses through a private lands program and increased crop production on the refuge.</p> <p>(g) Continue farming practices, including cooperative farming, as tools to maintain farm units in a condition free of Chinese tallow.</p> <p>(h) By 2016, update the cooperative farming management step-down plan.</p>	
Objective A-6: Artificial Uplands		
<p>Continue to maintain and mow approximately 26 miles of levees to discourage Chinese tallow invasion, maintain structural integrity, and reduce depredation on resident nesting waterfowl and other migratory birds.</p>	<p>Increase maintenance, mowing, and spraying of 26 miles of levees to discourage Chinese tallow invasion, maintain structural integrity, and reduce depredation on resident nesting waterfowl and other migratory birds. Rework 8-10 miles of levees on Units B and C by 2014, and rehabilitate 5-7 miles of south levee and west levee at Lacassine Pool by 2014.</p>	<p>Continue to maintain and mow approximately 26 miles of levees to discourage Chinese tallow invasion, maintain structural integrity, and reduce depredation on resident nesting waterfowl and other migratory birds. Rehabilitate 5-7 miles of south levee and west levee at Lacassine Pool by 2010.</p>
<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Annually survey levees for both structural integrity and infestation by exotics or invasive plant species to determine maintenance priorities for that year.</p> <p>(b) Monitor population trends of predators to see if temporary predator control trapping is advisable to protect nesting birds.</p> <p>(c) Use a combination of fire, herbicides, and mechanical control to confront and reverse infestation by invasive plant species.</p>	<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>
Objective A-7: Bottomland Hardwoods/Swamps		
<p>Protect existing bottomland hardwood swamp habitat on the refuge, specifically cypress-tupelo stands in</p>	<p>Protect and restore existing bottomland hardwood swamp habitat on the refuge, specifically cypress-tupelo stands in Upper Lacassine Bayou, Brown Island, Blue Grove and Black Grove within</p>	<p>Protect existing bottomland hardwood swamp habitat on the refuge, specifically cypress-tupelo stands in Upper Lacassine Bayou,</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
Upper Lacassine Bayou, Brown Island, Blue Grove and Black Grove within Lacassine Pool, Lacassine Point, the Headquarters Pond, and the mature live oaks in the refuge headquarters area.	Lacassine Pool, Lacassine Point, the Headquarters Pond, and the mature live oaks in the refuge headquarters area.	Brown Island, Blue Grove and Black Grove within Lacassine Pool, Lacassine Point, the Headquarters Pond, and the mature live oaks in the refuge headquarters area.
<p>Strategies</p> <p>Employ same strategies as Alternative B except for (b) and (e).</p>	<p>Strategies</p> <p>(a) Control Chinese tallow tree and other nuisance exotic plant species where they occur.</p> <p>(b) Investigate opportunities to restore bottomland hardwood acreage along the Mermentau River and Lacassine Bayou.</p> <p>(c) Protect existing cypress groves inside and outside of the pool; investigate opportunities to regenerate cypress within the groves.</p> <p>(d) Work with oil companies to avoid damage from seismic surveys; be vigilant that oil and gas exploration can cause permanent impacts to vegetation.</p> <p>(e) Plant cypress seedlings and other species and protect them with guards from depredation by nutria, rabbits, and deer.</p> <p>(f) Continue to document and protect the large live oak trees located in the vicinity of the refuge headquarters and staff housing.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B except for (b) and (e).</p>
Objective A-8: Wilderness Area		
Continue to monitor habitat changes in the Wilderness Area, conduct prescribed fire every 3-4 years, and investigate options for managing invasive plants.	Continue to monitor habitat changes in the Wilderness Area, conduct prescribed fire every 3-4 years, and investigate options for managing invasive plants and restoring hydrology to ponds.	Continue to monitor habitat changes in the Wilderness Area, conduct prescribed fire every 3-4 years, and investigate options for managing invasive plants.

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>a) Conduct aerial surveys at least once every two years to visually monitor and record habitat changes and migratory bird presence within the Wilderness Area.</p> <p>(b) Experiment with growing season fires that are expected to be more effective in controlling or reducing the encroachment of exotic species and undesirable species.</p> <p>(c) Fall burning should also be considered on an experimental basis to determine if fall burns will increase or decrease waterfowl use.</p> <p>(d) By 2014, update the wilderness management plan.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>
Objective A-9: Fire Management		
<p>Use fire as a multipurpose management tool to reduce hazardous fuels and promote habitat diversity. Utilize prescribed fire on approximately 10,000 acres per year.</p>	<p>Use fire as a multipurpose management tool to reduce hazardous fuels and promote habitat diversity. Utilize prescribed fire on approximately 10,000 acres per year.</p>	<p>Use prescribed fire as a multipurpose management tool only on Lacassine Pool itself with a 3-year rotation. Elsewhere on refuge, only wildfire suppression would be practiced.</p>
<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Implement subdividing the pool to create a more manageable wetland.</p> <p>(b) Update burn plans and fire management plan to include organic matter consumption burns (i.e., ground fires in drier conditions) to meet waterfowl habitat management needs of pool.</p> <p>(c) Rework canals along pool to provide a means of water for fire suppression purposes.</p> <p>(d) Burn management units in different years to lessen impacts on insects and birds.</p>	<p>Strategies</p> <p>Utilize same strategies as Alternative B except for (f) and (g).</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(e) Reduce hazardous fuels and the potential for uncontrollable wildfires using prescribed fire, mechanical or chemical treatments to protect life, property, industrial oil and gas infrastructure, and natural resources on the refuge.</p> <p>(f) Wildfires would be addressed in the fire management plan in such a manner as to complement habitat management on the refuge.</p> <p>(g) Prescribed fires to address hazardous material spills to minimize damage to the environment would be addressed in the fire management plan and prescription.</p> <p>(h) Hire six additional fire staff and provide support equipment, office space, and bunkhouse space to support fire management activities for refuges within the Southwest Louisiana National Wildlife Refuge Complex.</p> <p>(i) Complete a fire prescription for the Lacassine Pool by the year 2007 for moderate and severe fire conditions.</p>	
Objective A-10: Undesirable Plants and Animals		
Louisiana Department of Wildlife and Fisheries continues to control aquatic weeds on certain waterways and the refuge controls weeds on levees, farming and moist-soil units, and prairie with chemical controls, mechanical controls (e.g., mowing and manipulating water levels), and prescribed fire.	Reduce to lowest practical level all undesirable plants and animals on the refuge to minimize negative effects on native flora and fauna.	Louisiana Department of Wildlife and Fisheries continues to control aquatic weeds on certain waterways and the refuge controls weeds on levees, farming and moist-soil units, and prairie with chemical controls, mechanical controls (e.g., mowing and manipulating water levels), and prescribed fire, though at a reduced level from Alternative A.
<p>Strategies</p> <p>Employ same strategies as in Alternative B except for (b).</p>	<p>Strategies</p> <p>(a) By 2009, hold a training class to acquaint all refuge personnel with identification of current and potential weeds and develop literature that is brief and clear about potential pest problems</p>	<p>Strategies</p> <p>Employ same strategies as in Alternative B except for (b).</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>for refuge visitors.</p> <p>(b) By 2013, develop an invasive and nuisance species plan recommending methods such as pesticides, mechanical removal, trapping, and fire to control cogongrass, giant salvinia, water hyacinth, phragmites and alligator weed (indigenous but undesirable), nutria, feral hogs, and feral cats.</p> <p>(c) Burn to control Chinese tallow. Continue to use herbicides and mechanical methods to control Chinese tallow but restrict its application to injection or bark spray in sensitive areas, such as rookeries.</p> <p>(d) Maintain alligator hunting as an activity requiring a permit to remove nuisance alligators from the refuge as deemed necessary to benefit native habitats and other wildlife, and to provide for the safety of visitors.</p>	
<p>Goal B – Fish and Wildlife Management: Maintain healthy and viable wildlife and fish populations on the refuge to contribute to the purpose for which it was established and to the mission of the National Wildlife Refuge System.</p>		
<p>Objective B-1: Fisheries</p>		
<p>In cooperation with Louisiana Department of Wildlife and Fisheries and other partners, manage habitat, monitor water quality, and stock sport fish, thereby promoting healthy fishery resources consistent with the purposes of the refuge.</p>	<p>In cooperation with the Louisiana Department of Wildlife and Fisheries and other partners, manage habitat consistent with the purpose of the refuge, and monitor and seek ways to improve water quality and fishery resources to benefit migratory birds, fish, and other wildlife.</p>	<p>Stocking of fish in refuge waters will be limited to measures aimed at maintaining balanced fish populations or replacing populations decimated by unusually severe or atypical losses due to climatic or environmental factors. Stocking refuge waters with catchable-sized sport fish specifically to support recreational fishing is prohibited.</p>
<p>Strategies</p> <p>(a) Maximize family-oriented public use of the fishery resource, but limit fishing to the period from March 15 through October 15 to minimize</p>	<p>Strategies</p> <p>(a) Deepen the borrow ditch all around the flood side of the pool levee to achieve 7- to 8-foot water depths in some areas to improve fisheries habitat and increase the levee height.</p>	<p>Strategies</p> <p>Employ same strategies as in Alternative A.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>disturbance to wintering waterfowl. Rookeries should be protected from disturbance by keeping boats a minimum of 300 feet away.</p> <p>(b) Establish and maintain healthy and adequate sport fish populations by:</p> <ul style="list-style-type: none"> ▶ working with the Louisiana Department of Wildlife and Fisheries and the Service’s Fisheries personnel to obtain fish population data on an annual basis through electro-fishing, netting, angler surveys, and other standard sampling techniques. ▶ calculating Proportional Stocking Density, an index of population structure, using the data from previous sub-strategy. ▶ if Proportional Stocking Density calculations indicate a need, establish length or slot limits on largemouth bass. ▶ coordinating with federal and state hatcheries when fish stocking is necessary. <p>(c) Test largemouth bass for largemouth bass virus, use disease-free fish with all stockings and do not allow any tournament- caught or other fish to be released back into the pool after being held in live well or other temporary holding container.</p>	<p>(b) Deepen other ditches and ponds in the pool to 5 to 8 feet deep and a minimum of 20 feet wide to improve fisheries habitat.</p> <p>(c) Extend the life of the pool through drawdowns that would result in soil compaction and oxidation of accumulated organic matter when dry periods or drought allows. Fire should be used to reduce the organic matter accumulation when opportunities become available.</p> <p>(d) Provide family-oriented public use of the fishery resource, but limit fishing to the period from March 15 through October 15 inside the pool and year-round on customary and traditional fishing areas within the refuge to minimize disturbance to wintering waterfowl. Rookeries should be protected.</p> <p>(e) Establish and maintain, with partners, healthy and adequate sport fish populations by working with the Louisiana Department of Wildlife and Fisheries and the Service’s Fisheries personnel to obtain fish population data on an annual basis through electro-fishing, controlled angling, netting, angler surveys, and other standard sampling techniques.</p> <p>(f) Take all preventive measures possible to reduce or eliminate largemouth bass virus within waters.</p> <p>(g) Stocking of fish in refuge waters will be limited to measures aimed at maintaining balanced fish populations or replacing populations decimated by unusually severe or atypical losses due to climatic or environmental factors. Native species of fish would be the first choice for introductions. The refuge would work with the Louisiana Department of Wildlife and Fisheries and with the Natchitoches National Fish Hatchery to produce native bass fry for stocking. If native species cannot be</p>	

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	<p>used, non-native species may be used. Stocking refuge waters with catchable-sized sport fish specifically to support recreational fishing is prohibited.</p> <p>(h) By 2015, update the fisheries management plan.</p>	
Objective B-2: Migratory Waterfowl		
<p>Provide wintering habitat to support duck and geese populations at 50-70 percent of their historic 1970s levels.</p>	<p>Provide wintering habitat for ducks and geese to return to their historic 1970s population levels, consistent with the objectives of the North American Waterfowl Management Plan’s Gulf Coast Joint Venture, Chenier Plain Initiative (4,500,000 ducks and 526,000 geese respectively).</p>	<p>Provide wintering habitat for ducks and geese to return to their historic 1970s population levels, consistent with the objectives of the North American Waterfowl Management Plan’s Gulf Coast Joint Venture, Chenier Plain Initiative (4,500,000 ducks and 526,000 geese respectively).</p>
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Refer to strategies listed under Objective A-1 on Lacassine Pool.</p> <p>(b) For each waterfowl impoundment, keep records annually of flood and drawdown dates, water levels, land treatments (e.g., discing and herbicide treatments), and plant and migratory bird response to habitat availability.</p> <p>(c) Adjust land treatments to provide a complex of habitat types and maximize migratory bird response related to habitat availability.</p> <p>(d) Strive to gain complete water control on all areas managed for waterfowl.</p> <p>(e) Provide optimal water conditions (mid-August through mid-November) for early migratory birds and shorebirds.</p> <p>(f) Create a partnership between the refuge and the research community to promote monitoring and research to determine the most effective methods for waterfowl management.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(g) Record all management actions and implement adaptive management strategies to evaluate food production and wildlife response, and modify management actions to improve wildlife habitat.</p> <p>(h) Conduct waterfowl surveys on a unit-specific and species-specific basis from September through February. Habitat conditions and waterfowl numbers should be correlated to the degree possible to determine preferred habitat conditions throughout the winter period.</p> <p>(i) Within the pool, note areas preferred or avoided by waterfowl and investigate habitat conditions to determine if there is a correlation. Because of differences in species habitat preferences both within and among years, data should be recorded, archived, and analyzed over a period of years before irreversible actions are taken.</p> <p>(j) Expand the objectives of the waterfowl surveys conducted strictly for the purpose of determining peak waterfowl populations on the refuge and expand the survey to other southwest Louisiana refuges.</p>	
Objective B-3: Mottled Ducks		
Provide nesting, brood-rearing, and molting habitat for mottled duck populations to contribute to the goals and objectives of the North American Waterfowl Management Plan's Gulf Coast Joint Venture, Chenier Plain Initiative.	Provide nesting, brood-rearing, and molting habitat for mottled duck populations to contribute to the goals and objectives of the North American Waterfowl Management Plan's Gulf Coast Joint Venture, Chenier Plain Initiative. Enhance knowledge of this species to improve management.	Provide nesting, brood-rearing, and molting habitat for mottled duck populations to contribute to the goals and objectives of the North American Waterfowl Management Plan's Gulf Coast Joint Venture, Chenier Plain Initiative.
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Provide brood rearing water habitat through July, in at least one field of Units A, C, and E as part of a late summer drawdown.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(b) Participate in multi-agency efforts to capture and band pre-season mottled ducks consistent with coordinated banding objectives.</p> <p>(c) With partners, monitor mottled duck population trends on the refuge through summer/fall/winter aerial surveys and other rigorous and repeatable surveys as feasible.</p> <p>d) Support mottled duck research that seeks to clarify limiting factors and/or their mitigation.</p>	
Objective B-4: Cavity-nesting Ducks		
Conduct a program of 30 to 40 well-maintained nest boxes for wood ducks and black-bellied whistling ducks.	Conduct a program of 50 to 60 well-maintained nest boxes for wood ducks and black-bellied whistling ducks.	Conduct a program of 10 to 20 well-maintained nest boxes for wood ducks and black-bellied whistling ducks.
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Operate wood duck nest box program to meet regional guidelines dated May 23, 2003 (USFWS 2003), taking care that no more boxes than can be adequately maintained over the long term be erected.</p> <p>(b) Evaluate nest use and nesting success in boxes and adjust the program accordingly.</p> <p>(c) Use partners, volunteers, interns, refuge personnel, and others to construct, install, and clean boxes at least once and as many as 2-4 times annually.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>
Objective B-5: Shorebirds		
Provide 50-75 acres of late summer/fall foraging habitat for shorebirds to contribute to the goals of the United States Shorebird Conservation Plan.	Provide 200-300 acres of late summer/fall foraging habitat for shorebirds to contribute to the goals of the U.S. Shorebird Conservation Plan; in addition, coordinate cooperative farming program to further enhance shorebird habitat where feasible.	Lacassine Pool management emphasis would preclude providing any dedicated acreage to shorebirds in the late summer and fall.

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<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Where possible, provide 200 – 300 acres of shallow water and mudflat habitat suitable for shorebird foraging during the fall migration period (July – November). At least one 50- to 100-acre block of suitable habitat should be provided at all times for roosting habitat, particularly during the driest periods when little other habitat is available in southwest Louisiana.</p> <p>(b) In keeping with the American Woodcock Management Plan, develop and/or maintain preferred woodcock habitat where it exists on the refuge. Crepuscular (twilight) cover and foraging habitat for woodcock includes thickets and shrub areas with high vertical stem density in the understory. Preferred nocturnal habitat includes wet agricultural fields (not fall disced) and wet “old fields” with exposed soil and patchy cover 19 – 39 inches in height created by cool fall burns.</p>	<p>Strategies</p> <p>No strategies would be necessary for this alternative, which deemphasizes efforts on behalf of shorebirds.</p>
Objective B-6: Colonial Waterbirds		
<p>Maintain and monitor nesting and foraging habitat for colonial waterbirds to contribute to the goals and objectives of the North American Waterbird Conservation Plan.</p>	<p>Maintain and enhance nesting and foraging habitat for colonial waterbirds to contribute to the goals and objectives of the North American Waterbird Conservation Plan.</p>	<p>Maintain, monitor, and enhance nesting and foraging habitat for colonial waterbirds within Lacassine Pool only to contribute to the goals and objectives of the North American Waterbird Conservation Plan.</p>
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Monitor historic rookery areas and survey potential habitat in other portions of the refuge. Maintain records of species and estimated numbers. Supplemental data that might be useful to collect include dates of nesting initiation; fledging dates; water depths below rookery; nest substrate vegetation, including vegetative composition; and tree heights.</p> <p>(b) Protect active rookeries from excessive disturbance during the breeding season. Utilize signs to inform</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B, but with emphasis on Lacassine Pool.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>the public to respect the buffer zone and minimize disturbance.</p> <p>(c) Maintain existing and provide additional colonial waterbird nesting habitat through water level management, tree planting, and beneficial dredge spoil placement.</p>	
Objective B-7: Marsh Birds		
<p>Use prescribed fire and mowing to protect nesting habitats in the impounded freshwater marshes for marsh birds, such as the purple gallinule, common moorhen, pied-billed grebe, least and American bittern, and king rail.</p>	<p>Use prescribed fire and mowing to protect and enhance nesting habitats in the impounded freshwater marshes for marsh birds, such as the purple gallinule, common moorhen, pied-billed grebe, least and American bittern, and king rail.</p>	<p>Use prescribed fire and mowing to protect and enhance nesting habitats Lacassine Pool for marsh birds, such as the purple gallinule, common moorhen, pied-billed grebe, least and American bittern, and king rail.</p>
<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>	<p>Strategies</p> <p>a) Continue monitoring purple gallinule and common moorhen and seek to expand monitoring efforts to include pied-billed grebe, least and American bittern, and king rail.</p> <p>(b) Implement the Service’s secretive marsh bird survey protocol and contribute information to regional and national databases.</p> <p>(c) Investigate possibilities and methodologies to sample the refuge for high conservation priority transient/ wintering marsh bird species, such as black and yellow rails.</p> <p>(d) Analyze the existing gallinule/moorhen database and compare to management practices in the survey unit (e.g., prescribed burns and vegetation/water level management).</p> <p>(e) Investigate the potential for providing sandhill crane roosting and foraging habitat on the refuge, such as restored prairie, or corn or sorghum stubble fields</p>	<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
Objective B-8: Non-game Resident and Migratory Landbirds		
<p>Maintain habitat values on marshes, impoundment levees, shrub-dominated sites, and grasslands for non-game migratory and resident landbirds to contribute to the Partners in Flight objectives as outlined in the Coastal Prairies (Physiographic area #06) Partners in Flight Bird Conservation Plan.</p>	<p>With partners on private and Service lands, improve habitat values on marshes, impoundment levees, shrub-dominated sites, forested areas, and grasslands for non-game migratory and resident landbirds to contribute to the Partners in Flight objectives as outlined in the Coastal Prairies (Physiographic area #06) Partners in Flight Bird Conservation Plan.</p>	<p>Reduce management emphasis on non-game resident and migratory landbirds.</p>
<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Establish points and conduct point counts throughout the refuge to monitor bird species and document change related to management actions.</p> <p>(b) Investigate opportunities for protection of existing forested areas within the approved acquisition boundary along Lacassine Bayou and the Mermentau River.</p> <p>(c) With partners or other means, seek to restore forested areas along river corridors in southwestern Louisiana.</p> <p>(d) Work with partners to create, restore, and enhance habitat for grassland-dependent land birds. (See Objective A-4, Coastal Prairies).</p>	<p>Strategies</p> <p>No strategies would be necessary for this alternative, which deemphasizes efforts on behalf of non-game resident and migratory landbirds.</p>
Objective B-9: Alligators		
<p>Continue to monitor alligator populations and follow Louisiana Department of Wildlife and Fisheries recommendations on annual harvest quotas.</p>	<p>In coordination with Louisiana Department of Wildlife and Fisheries, monitor alligator populations, establish a desirable alligator density objective for the refuge within five years of the approval of this plan, and cooperate with the Department in setting annual harvest quotas.</p>	<p>In coordination with Louisiana Department of Wildlife and Fisheries, monitor alligator populations, establish a desirable alligator population objective for the refuge within five years of the approval of this plan, and work with the Department in setting annual harvest quotas.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>Strategies</p> <p>(a) Continue to contract with the Louisiana Department of Wildlife and Fisheries to conduct intensive aerial alligator nest surveys and furnish a survey report to the refuge manager.</p> <p>(b) Continue the existing tag and release study, as necessary, to evaluate alligator survival and growth. The annual harvest program provides an opportunity to recover tagged alligators and associated data.</p> <p>(c) Refuge personnel should intensively monitor the annual harvest of alligators and other species taken on the refuge, collecting all data necessary to make sound biological decisions and adjust harvest strategies accordingly.</p> <p>(d) Continue prohibition of alligator egg collection and discourage collection on the leased Cameron Parish School Section property.</p> <p>(e) Continue nest searches and nighttime surveys to determine size classes and relative abundance.</p>	<p>Strategies</p> <p>(a) Continue consulting with the Louisiana Department of Wildlife and Fisheries to monitor annual harvest, conduct more intensive aerial alligator nest surveys, and collect all data necessary to make sound biological decisions.</p> <p>(b) Consult with the Louisiana Department of Wildlife and Fisheries to develop a customized harvest strategy that will focus on achieving target population goals, including desired age/sex composition.</p> <p>(c) By 2018, revise the alligator and furbearer harvest plans.</p> <p>(d) Continue prohibition of alligator egg collection.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>
Objective B-10: Resident Wildlife (Mammals, Reptiles, Amphibians)		
<p>Maintain diversified habitats and promote management actions that would support healthy populations of indigenous</p>	<p>With partners, maintain and develop diversified habitats and promote management actions that would support healthy populations of indigenous wildlife species to meet the mission of the</p>	<p>Reduce emphasis on management actions for populations of indigenous resident wildlife species outside of the pool.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
wildlife species to meet the mission of the National Wildlife Refuge System.	National Wildlife Refuge System.	
<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Continue to use hunting as a tool to manage wildlife populations where it is compatible with other refuge purposes and activities.</p> <p>(b) Continue and expand the monitoring program for reptiles and amphibians. Incorporate control sites for the oil and gas disturbance study into a long-term monitoring program.</p> <p>(c) Protect and monitor alligator snapping turtle populations on the Refuge. Identify and protect their nest sites. Determine the methods and frequency of intentional and incidental harvest and its importance to the local community.</p>	<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>
Objective B-11: Species of Special Concern		
With partners, manage populations and habitats to support and increase numbers of threatened and endangered species and species of concern to meet objectives of the National Wildlife Refuge System Improvement Act of 1997.	With partners, manage populations and habitats to support and increase numbers of threatened and endangered species and species of concern to meet the objectives of the National Wildlife Refuge System Improvement Act of 1997.	With partners, manage populations and habitats to support and increase numbers of threatened and endangered species and species of concern to meet the objectives of the National Wildlife Refuge System Improvement Act of 1997.
<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>	<p>Strategies</p> <p>(a) Continue to monitor bald eagle use of the refuge as part of the Mid-Winter Bald Eagle Survey.</p> <p>(b) To protect turtles and paddlefish, continue prohibition on the use of commercial fishing gear within the refuge boundaries.</p> <p>(c) To help conserve paddlefish, improve water quality in the streams through reforestation incentives via the Partners for Fish and Wildlife Program, or through</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>acquisition of streamside habitat within the approved acquisition boundary.</p> <p>(d) Provide assistance to Louisiana Department of Wildlife and Fisheries on state jurisdictional waters within the refuge boundaries with population monitoring and restoration efforts and work with them to ban trammel, gill, and hoop nets.</p> <p>(e) With partners, investigate opportunities to protect the paddlefish spawning area on Bayou Nezpique through landowner incentives or acquisition.</p> <p>(f) Continue to monitor wading bird nesting colonies for presence of roseate spoonbill and glossy ibis; provide information on numbers and locations to Louisiana Natural Heritage Program.</p> <p>(g) Where appropriate and feasible, initiate surveys for other federal species of management concern or state-rare species, such as winter surveys for Henslow’s and grasshopper sparrow on the Duralde Prairie.</p> <p>(h) Where appropriate and feasible, undertake management actions to provide habitat for other federal species of management concern or state-rare animal species, such as installation of nest platforms for osprey.</p> <p>(i) Report any occurrences of other state-rare animal species on the refuge to Louisiana Natural Heritage Program .</p>	
Goal C – Oil and Gas Infrastructure and Activities: Manage petroleum infrastructure and activities to protect migratory birds, fish, and other wildlife and their habitats.		
Objective C-1: Protection and Management		
<p>Continue to monitor and manage oil and gas activities to minimize impacts on migratory birds, fish, and other wildlife and their habitats.</p>	<p>Increase protection and management of petroleum activities to minimize impacts on migratory birds, fish, and other wildlife and their habitats.</p>	<p>Increase protection and management of petroleum activities within Lacassine Pool alone, to minimize impacts on migratory birds, fish, and other wildlife and their habitats. Elsewhere on refuge, efforts would be the same as at present.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Maintain good communication with oil and gas exploration and development companies so that they are well aware that the refuge is closed to most surface activities from October through March to minimize disturbance to wintering waterfowl.</p> <p>(b) Require all spills of any quantity to be reported to the refuge so proper and prompt cleanup can be assured.</p> <p>(c) By 2015, update the oil and gas management plan.</p> <p>(d) Ensure that all future management for existing oil and gas transmission lines and operations are managed per Fish and Wildlife Service Policy. (Reference Fish and Wildlife Manual: FWS 603, Section 2.11 D and Chapter II of the Comprehensive Conservation Plan, Refuge Related Problems, Oil and Gas Activities).</p>	<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>
Objective C-2: Reclamation		
<p>Maintain current levels of surface reclamation at former petroleum extraction sites to improve habitat for wintering migratory birds and other species.</p>	<p>Increase surface reclamation at former petroleum extraction sites to improve habitat for wintering migratory birds and other species.</p>	<p>Increase surface reclamation at former petroleum extraction sites on Lacassine Pool to improve habitat for wintering migratory birds and other species.</p>
<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Identify wells that need to be plugged and abandoned, remnant equipment that needs to be removed and possible related contamination issues and communicate these needs to the responsible oil and gas company.</p> <p>(b) Allocate the staff time necessary to coordinate new activities and cleanup.</p> <p>(c) Develop a database to track well status and pipeline locations, along with current ownership.</p>	<p>Strategies</p> <p>Utilize same strategies as in Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
Goal D – Public Use Management: Encourage outdoor wildlife-dependent public use on Lacassine National Wildlife Refuge to the extent that it is compatible with the refuge purposes.		
Objective D-1: Visitor Services		
Continue to focus on managing fishing and hunting programs, respond to public requests for environmental education/interpretation, and maintain existing facilities for observation/photography.	By 2012, complete steps to enhance the refuge’s infrastructure and operations to provide for quality, wildlife-dependent public use.	Continue to support wildlife viewing opportunities at Lacassine Pool
<p>Strategies</p> <p>Employ same strategies as Alternative B, except (d), (f), and (g).</p>	<p>Strategies</p> <p>(a) By 2012, develop an up-to-date step-down visitor services management plan that includes recommendations for wildlife-dependent recreation. The visitor services plan would encompass environmental education, interpretation, wildlife observation, wildlife photography, and outreach.</p> <p>(b) Develop the means to obtain accurate visitor counts and projected visitation.</p> <p>(c) Improve quality and quantity of information about the refuge, including signs and radio messages.</p> <p>(d) Continue to maintain the road to Lacassine Pool</p> <p>(e) Develop a law enforcement step-down plan by 2008.</p> <p>(f) Hire one full-time law enforcement officer.</p> <p>(g) Hire a park ranger for visitor services (e.g., environmental education and interpretation) to work under the direction and guidance of the Complex outreach coordinator.</p> <p>(h) Make various specific improvements to the refuge facilities and operations over the coming five years, including the following:</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B, except (f), (g), and (h).</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<ul style="list-style-type: none"> ▶ Work with the State of Louisiana Highway Department to standardize all highway signs regarding look and information; use Lacassine National Wildlife Refuge on all signs. ▶ Keep kiosk/public contact/boardwalk areas clean and gate areas well mowed. ▶ Rebuild the kiosk at the office. ▶ Place an informational kiosk at fishing area at end of Streeter Road. ▶ Build public restrooms at Lacassine Pool. ▶ Devise a plan to deal with litter as visitation increases. 	
Objective D-2: Hunting		
Offer quality hunting experiences for hunters; review the refuge hunting program on an annual basis to monitor its success and to consider ways of improving the program.	Offer quality hunting experiences for hunters; review the refuge hunting program on an annual basis to monitor its success and to consider ways of improving the program.	Offer quality hunting experiences for hunters; review the refuge hunting program on an annual basis to monitor its success and to consider ways of improving the program.
<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>	<p>Strategies</p> <p>(a) Allow harvesting of white-tailed deer with archery equipment from approximately October 1 until approximately October 31, or the beginning of duck season, to control deer numbers and maintain a healthy deer herd. Consider expanding the season to include a 1- to 2-day, shotgun-only hunt for deer herd control.</p> <p>(b) Adjust waterfowl hunting schedule to coordinate with Sabine Refuge. Both refuges would be open four days a week. This action eliminates one day from the current schedule for Lacassine Refuge and adds one day for Sabine Refuge.</p> <p>(c) Continue the lottery waterfowl hunt for youths and seniors during second split of duck season and general adult lottery hunt for both splits.</p>	<p>Strategies</p> <p>Employ same strategies as in Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(d) During the lottery hunts, place a temporary sign at head of Streeter Road that says: “Observation Tower Closed until Noon - Hunt in Progress.” Also, improve the crossovers/bridges used during the lottery hunt.</p> <p>(e) Consider a special lottery season for rabbit hunting during the month of February, within the agricultural area and Gulf Intracoastal Waterway levee systems. Any such hunt must be sensitive to waterfowl disturbance and should be delayed until after the waterfowl season.</p> <p>(f) Assess the feasibility of allowing commercial guiding. If guiding is allowed, it would be under the auspices of the Recreation Fee Demonstration Program.</p> <p>(g) Modify lottery hunt blinds to make them safer and more accessible.</p> <p>(h) Consider participating in the Recreation Fee Demonstration Program to charge fees for the lottery hunt and the refuge hunting permit.</p> <p>(i) By 2012, update the hunting management plan.</p>	
Objective D-3: Fishing		
Offer quality fishing experiences for anglers and review the refuge fishing program on an annual basis to monitor its success.	Offer quality fishing experiences for anglers and review the refuge fishing program on an annual basis to monitor its success.	Offer quality fishing experiences for anglers and review the refuge fishing program on an annual basis to monitor its success.
<p>Strategies</p> <p>(a) Develop specific fishing recommendations in a step-down management plan on fishing that would pursue a balance between the needs of “average anglers” and organized events so as to minimize conflicts between the two</p>	<p>Strategies</p> <p>(a) Fishing tournaments would be permitted under a regulated schedule to minimize conflicts with other users. Permit fees would be assessed per tournament day and be commensurate with fees charged by other host landowners in the Southeast Region.</p>	<p>Strategies</p> <p>(a) Develop specific fishing recommendations in a step-down management plan on fishing that would pursue a balance between the needs of “average anglers” and organized events so as to minimize conflicts between the two groups.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>groups.</p> <p>(b) Continue to partner with individuals who participated in the 2003 focus group on Lacassine Pool management issues.</p> <p>(c) Require “Bike Safety” flag in boats in the pool.</p> <p>(d) Keep bank fishing area clean through a combination of education, signage, refuse containers, and pickup by staff or volunteers.</p> <p>(e) Do not permit commercial guiding on the refuge.</p> <p>(f) Clean out some of the vegetation at the accessible dock.</p> <p>(g) In fishing brochure make “Unit B open year-round” more understandable.</p> <p>(h) Sponsor a fishing activity at the pool for kids during National Fishing Week.</p> <p>(i) Partner with a local group to conduct on-site youth fishing event.</p> <p>(j) Put solid substrate in some dock areas and designate special youth only days.</p> <p>(k) Maintain existing boat launches and furnish additional access to the pool as needed, and increase public access within the pool through construction of the canal</p>	<p>(b) Develop more specific recommendations in a step-down management plan on fishing that would pursue a balance between the needs of “average anglers” and organized events so as to minimize conflicts between the two groups.</p> <p>(c) Maintain communication between the refuge and individuals with fishing interests.</p> <p>(d) Investigate safety measures to avoid boating accidents, such as requiring use of “Bike Safety” flags in boats in the pool.</p> <p>(e) With partners, strive to keep bank fishing area clean through a combination of education, signage, and litter pickup.</p> <p>(f) Assess the feasibility of allowing commercial guiding. If guiding is allowed, it would be under the auspices of the Recreation Fee Demonstration Program.</p> <p>(g) Charge a daily or annual launch fee with the proceeds dedicated to the refuge.</p> <p>(h) By 2011, update the sport fishing plan.</p>	<p>(b) Require “Bike Safety” flag in boats in the pool.</p> <p>(c) Keep bank fishing area clean through a combination of education, signage, refuse containers, and pickup by staff or volunteers.</p> <p>(d) Do not permit commercial guiding on the refuge.</p> <p>(e) Charge a launch fee (or an annual launch fee), the proceeds from which would be dedicated to Lacassine Pool management and conservation.</p> <p>(f) In fishing brochure make “Unit B open year round” more understandable.</p> <p>(g) Maintain existing boat launches.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
system, keeping in mind potential disturbance to migratory birds, etc.		
Objective D-4: Wildlife Observation and Photography		
Maintain existing opportunities for wildlife observation and wildlife photography by maintaining certain facilities over the coming decade.	Enhance existing opportunities for wildlife observation and wildlife photography by upgrading certain facilities over the coming decade.	Enhance existing opportunities for wildlife observation and wildlife photography by upgrading certain facilities at Lacassine Pool over the coming decade.
<p>Strategies</p> <p>(a) At the headquarters area, clean up the boardwalk, make sure all the rails and planks are safe, and remove the duck box from the boardwalk.</p> <p>(b) Replace the kiosk at the headquarters area..</p> <p>(c) Work with Friends Group to sponsor refuge photo contest.</p>	<p>Strategies</p> <p>(a) Concentrate on birders as an audience to promote wildlife observation.</p> <p>(b) Identify areas to enhance as hiking-bird watching locations.</p> <p>(c) Work with Friends Group to sponsor refuge photo contest.</p> <p>(d) Work with local photographer to generate list of good photo spots.</p> <p>(e) Develop a parking lot at Unit B, Wildlife Observation Trail North, and interpretive signs for wood duck and warbler boxes.</p> <p>(f) Through partners, install observation tower at Duralde Prairie.</p> <p>(g) Allow commercial guiding if determined feasible. Guiding, if allowed, would be under the auspices of the Recreation Fee Demonstration Program.</p>	<p>Strategies</p> <p>(a) At the headquarters area, clean up the boardwalk, make sure all the rails and planks are safe, and remove the duck box from the boardwalk.</p> <p>(b) Replace the kiosk at the headquarters area.</p> <p>(c) Work with Friends Group to sponsor Lacassine Pool photo contest.</p> <p>(d) Develop a parking lot at Unit B, Wildlife Observation Trail North, and interpretive signs for wood duck and warbler boxes.</p>
Objective D-5: Environmental Education and Interpretation		
Retain current environmental education and interpretation program and exhibits.	Coordinate with other refuges within the Complex to implement environmental education and interpretation.	Coordinate with other refuges within the Complex to implement environmental education and interpretation.
<p>Strategies</p> <p>(a) Focus on programs that don't depend on individuals, possibly volunteer based; develop</p>	<p>Strategies</p> <p>(a) With partners and Friends Groups, find a volunteer cadre to manage the environmental education program within the Complex for a variety of audiences.</p>	<p>Strategies</p> <p>Employ same strategies as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>canned programs and work with Friends Group to train volunteers to present the programs.</p> <p>(b) Seek other audiences for which to provide environmental education, including scout groups, 4-H clubs, home schools, and teachers.</p> <p>(c) Focus part of the intern program on environmental education internships.</p> <p>(d) Add interpretive panels to the Streeter tower.</p> <p>(e) Continue to protect large, old live oaks in headquarters area; perhaps develop interpretive panel.</p>	<p>(b) With partners, develop kits and material for environmental education, conduct teacher training, and provide kits/materials to the teachers on a check-out basis.</p> <p>(c) Use interns and Student Temporary Employment Program hires to develop and conduct environmental education programs.</p> <p>(d) As the outdoor interpretive program is enhanced, the following themes/topics should be considered:</p> <ul style="list-style-type: none"> ▶ Coastal prairie; ▶ Purpose/importance of this refuge for migratory waterfowl (e.g., pintails); ▶ Management of freshwater wetlands; ▶ Invasive species management; ▶ National wildlife refuges in Louisiana; and ▶ Paddlefish in Mermentau River. <p>(e) Interpret value of large, old live oaks in the headquarters area.</p>	
Objective D-6: Friends, Volunteers, Partners, Interns		
<p>Manage 1-2 full-time interns per year, 5-10 part-time volunteers per year, and continue to work with Friends of Lacassine National Wildlife Refuge and and Cajun Prairie Habitat Preservation Society.</p>	<p>Provide additional opportunities for friends, volunteers, partners, and interns to assist the refuge and extend the reach of refuge staff.</p>	<p>Less emphasis on recruiting and using volunteers for refuge-wide habitat management and education efforts.</p>
<p>Strategies</p> <p>Employ same strategies as Alternative B except for (b), (h) and (i).</p>	<p>Strategies</p> <p>(a) Nurture and strengthen Friends Groups to include Friends of Lacassine National Wildlife Refuge and Friends of Southwest Louisiana National Wildlife Refuges and Wetlands.</p> <p>(b) Partner with the Cajun Prairie Habitat Preservation Society to manage the Duralde Prairie tract.</p> <p>(c) Continue partnership with local school groups for wood duck box project.</p>	<p>Strategies</p> <p>(a) Continue partnership with Future Farmers of America for wood duck box project.</p> <p>(b) Encourage Friends of Lacassine Refuge to establish a separate identity from the Lake Arthur Convention and Visitors Bureau.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
	<p>(d) Continue to cooperate closely with the Friends Group; work with the group to manage a volunteer program.</p> <p>(e) Have staff identify projects that can be done by volunteers; develop specific job descriptions and timelines (e.g., develop volunteer group to do wood duck box monitoring).</p> <p>(f) Promote the need for friends and volunteers through local media.</p> <p>(g) By 2012, update the volunteers, friends, and partnerships plan.</p> <p>(h) Encourage the Friends of Lacassine National Wildlife Refuge and the budding Friends of Southwest Louisiana National Wildlife Refuges and Wetlands to work together and partner on mutual projects of interest.</p>	<p>(c) Continue to cooperate closely with the Friends Group; work with group to have it assist in managing a volunteer program.</p>
GOAL E – CULTURAL RESOURCES: Protect refuge cultural resources in accordance with federal and state historic preservation legislation and regulations.		
Objective E-1: Survey		
Assess the feasibility of conducting a refuge-wide archaeological survey.	Over the life of the comprehensive conservation plan, assess the feasibility of conducting a refuge-wide archaeological survey.	Assess the feasibility of conducting a refuge-wide archaeological survey.
<p>Strategies</p> <p>Same as Alternative B.</p>	<p>Strategies</p> <p>(a) Contact the State Historic Preservation Officer to determine if any known archaeology sites exist within the vicinity of the refuge.</p> <p>(b) Determine the cost of conducting the study and seek resources to accomplish the work.</p> <p>(c) Consult the Regional Historic Preservation Officer for guidance.</p>	<p>Strategies</p> <p>Same as Alternative B.</p>
Objective E-2: Education		
	Develop and implement an educational program that would provide an understanding and appreciation of the refuge's ecology and the human influence on the region's ecosystems.	

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
<p>Strategy</p> <p>Same as Alternative B.</p>	<p>Strategy</p> <p>(a) Work with local ethnic groups (e.g., Native American, African American, Creole, and Cajun) to develop an education program regarding their cultural heritage and history.</p>	<p>Strategy</p> <p>Same as Alternative B.</p>
Objective E-3: Cultural Resources Management Plan		
	<p>By the year 2020, develop a step-down cultural resources management plan.</p>	
<p>Strategy</p> <p>Same as Alternative B.</p>	<p>Strategy</p> <p>(a) Consult the Regional Historic Preservation Officer for guidance.</p>	<p>Strategy</p> <p>Same as Alternative B.</p>
GOAL F— REFUGE COMPLEX OPERATIONS: Develop and maintain the Southwest Louisiana National Wildlife Refuge Complex Headquarters to: 1) support, direct, and manage the needs, resources, and staff of Cameron Prairie, Lacassine, Sabine, and Shell Keys National Wildlife Refuges and their relationship with each other; 2) manage the role of the Service as a partner in the multi-agency Cameron Creole Watershed Project; and 3) and interact with the state-managed Rockefeller Refuge.		
Objective F-1: Complex Staffing		
<p>Maintain current Complex staff locations all three refuges.</p>	<p>By 2010, any Lacassine Refuge staff members with responsibilities for Complex-wide programs and general administration would be stationed at the at Cameron Prairie Refuge headquarters, as appropriate.</p>	<p>By 2015, staff members with responsibilities for Complex-wide programs would be stationed at the Cameron Prairie Refuge headquarters.</p>
<p>Strategies</p> <p>Employ same strategies as Alternative B except for (a).</p>	<p>Strategies</p> <p>(a) Personnel actions would be performed as appropriate to assign positions currently at the refuge that have Complex-wide responsibilities and general administration to the Complex headquarters.</p> <p>(b) Staff members within the entire Complex would be provided adequate equipment, such as computers, vehicles, and supplies, as well as training needed to perform their jobs.</p> <p>(c) Staff members would be provided a safe and healthy working environment.</p>	<p>Strategies</p> <p>Same as Alternative B.</p>

Alternative A – No Action	Alternative B – Improve management effort in all programs	Alternative C – Focus on Pool management only
Objective F-2: Complex Support		
	<p>The Southwest Louisiana National Wildlife Refuge Complex would encourage and support each refuge's major focus (e.g., environmental education, interpretation, and research) and the relationship of these programs to wildlife and habitat management objectives and strategies.</p>	
<p>Strategies</p> <p>Same as Alternative B.</p>	<p>Strategies</p> <p>(a) Resources needed to attain success in achieving the objective would be allocated to address the highest priority needs of the Complex.</p> <p>(b) Complex staff would support individual refuge needs and would provide expertise and assistance as needed to each refuge's staff.</p> <p>(c) The Cameron Prairie Visitor Center would serve as the Southwest Louisiana National Wildlife Refuge Complex Visitor Center and would include interpretive displays and exhibits about Lacassine Refuge. It would be modified to interpret the purpose of Lacassine Refuge, other refuges in the Complex, the multi-agency Cameron Creole Watershed Project, and the interaction between the Service and the state-managed Rockefeller Refuge.</p>	<p>Strategies</p> <p>Same as Alternative B.</p>

III. Affected Environment

REFERENCE

Background information, as well as a description of the environment affected by the proposed management actions and activities, is described in Section A, Chapter II.

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IV. Environmental Consequences

OVERVIEW

Outlined below are the predicted impacts that could result from the implementation of proposed actions described in Alternatives A, B, and C. Each alternative portrays expected outcomes for fish and wildlife species through the year 2020, varying in magnitude with the intensity of management.

Alternative A essentially amounts to “staying the course.” In and of themselves, Alternative A’s proposed management actions would have minimal to no direct adverse effects on the environment. At the same time, the limitations imposed on proactive management of moist-soil units, coastal prairie, unimpounded marshes, and especially the Lacassine Pool, under Alternative A, would likely perpetuate recent unfavorable trends in habitat succession, leading to cumulative adverse impacts. This would be counterproductive for waterfowl and other water-dependent migratory birds, and in turn, for public use opportunities, primarily fishing, on the refuge.

Proposed management actions described in Alternative B, the proposed alternative, would, in general intensify active management of refuge habitats, including moist-soil units, coastal prairie, levees, and Lacassine Pool. This would have beneficial effects on waterfowl and other migratory birds, as well as on public use opportunities (e.g., fishing) in Lacassine Pool. Habitats would be acquired and managed within the approved acquisition boundary of the refuge. The lifetime of open-water aquatic habitat on which both migratory bird habitat and the fishery resource in the pool depend could be prolonged under this alternative. Nevertheless, once or more every decade the entire pool or large portions of it would be closed to fishing, while they are dewatered and dried so that accumulating organic matter on the bottom of the pool can be burned off. In addition, this alternative would deepen certain channels to provide deeper-water refugia for fish during drier seasons.

Under Alternative C, the refuge would focus its staff and budget on managing Lacassine Pool for wintering waterfowl. Thus, the rest of the refuge (i.e., about half of it) would not be more intensively managed and might even receive less attention than at present. Intervention in the process of natural succession that tends to fill in all ponds and lakes over time with sediments, accumulated organics, or both, would extend the useful life of Lacassine Pool for both migratory waterfowl and the resident fish population. Thus, migratory birds would benefit directly; moreover, a secondary or indirect benefit would occur with the fishery in Lacassine Pool and the public use that depends on it. Nonetheless, seasonal water levels in the pool would be managed primarily for the benefit of waterfowl, which at times would be sub-optimal for the fishery and lead to reduced fish populations.

EFFECTS COMMON TO ALL ALTERNATIVES

This section assesses the environmental impacts of implementing the comprehensive conservation plan on the biological, physical, social, economic, cultural, and historic resources of the refuge. Some of the predicted impacts are common to all alternatives. A brief discussion of these impacts is outlined in the following paragraphs.

FISH, WILDLIFE, AND HABITAT

Each alternative would protect habitat for wildlife, including migratory and resident birds, mammals, reptiles, amphibians, fish, and invertebrates. The refuge hosts few threatened, endangered, or sensitive species – among them the bald eagle, Louisiana black bear (rarely), and alligator snapping turtle. None of the alternatives are likely to have adverse effects on these species.

Alternative A would provide for a moderate amount of habitat management at current levels, while Alternative B would intensify and extend this management to reverse unfavorable trends in habitat succession on impoundments and moist-soil units. Alternative C would provide for intensive management of Lacassine Pool for migratory waterfowl and moderate habitat management elsewhere. Thus, each of the alternatives would foster habitat for fish and wildlife (although the types of fish and wildlife favored by likely habitat changes would differ somewhat). The boundaries of the Wilderness Area would remain unchanged in all three alternatives.

The habitats that are already present on the refuge, including wetlands (both open water and marsh), moist-soil units, cropland, woodlands, and coastal prairie, would continue under each alternative, but to differing degrees. Invasive plants and animals that now infest the refuge would also persist to some extent under each alternative. Each of the alternatives would continue to provide sanctuary in Lacassine Pool for wintering waterfowl. In addition, each would maintain some habitat for shorebirds, wading birds, marsh birds, raptors, neotropical migratory birds, white-tailed deer, swamp rabbit, non-native nutria, as well as alligators and other reptiles and amphibians. Fish species, such as catfish, bowfin, bass, bream, crappie, and gar, would also continue to be found at Lacassine Refuge.

None of the alternatives would directly impact water quality, air quality, noise levels, or surrounding land uses. Limited oil and gas exploration and production would continue on the refuge (since sub-surface rights are not owned by the refuge), with some potential for localized water contamination by petrochemicals around well sites, as well as problems with invasive species encroachment and the need for habitat restoration on ring levees.

PUBLIC USE

Each of the three alternatives would maintain or expand public use opportunities and facilities at Lacassine Refuge. Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation would all be accommodated and encouraged under Alternative A (No Action), Alternative B (Proposed Action), and Alternative C (Focus on pool management only). Each alternative would involve preparation of a visitor services plan, which would include recommendations for environmental education, interpretation, and outreach, and should include recommendations for a safe, quality experience for all visitors. Each alternative would also provide some improvement of services and education available to the public at Lacassine Pool and the headquarters area.

Hunting for waterfowl would occur on the same area under each alternative (10,434 acres), and Lacassine Pool itself would remain a waterfowl sanctuary under each. The same archery deer season would occur under each alternative, and a rabbit season would be considered under each alternative. Recreational fishing, particularly on Lacassine Pool, would be encouraged under each alternative. Opportunities for wildlife observation and wildlife photography would be maintained under each alternative, with the majority of this occurring at the pool. Similarly, environmental education and interpretation would be maintained at the refuge and in the surrounding community.

Each of the alternatives would offer some benefit to the local economy, through visitation and use by local residents and non-resident visitors, as well as from purchases in the local economy by the refuge and its employees. Hunting, fishing, wildlife observation, and wildlife photography all contribute to local economic activity through purchases of food, lodging, gasoline, supplies, and from sales taxes. In addition, the Refuge Revenue Sharing Act requires the Service to make payments to local taxing authorities to offset the loss in tax revenue when private land is acquired for a refuge. These payments would continue under each of the alternatives.

CULTURAL RESOURCES

Each of the alternatives would protect refuge cultural resources in accordance with federal and state historic preservation legislation and regulations. A cultural resources management plan would be prepared under each alternative and the feasibility of conducting an extensive archaeological resources survey would be determined. In addition, the refuge would work with local stakeholders, such as American Indian tribes, Cajun, Creole, and African American groups to develop an education program regarding their cultural heritage and history.

Each alternative affords land protection and low levels of development, thereby producing little adverse effect on the cultural and historic environment. In most cases, any management actions that would involve substantial excavation such as to create new levees would require review by the Regional Archaeologist and consultation with the Louisiana State Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. Determining whether a particular action within an alternative has the potential to affect cultural resources is an ongoing process that would occur during the planning stages of every project. Service management of land with known or potential archaeological or historical sites provides two major types of protection for these resources – protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a federal agency that may impact archaeological or historical resources be reviewed by the State Historic Preservation Office and that the identified impact be avoided or mitigated. Service policy is to preserve these resources in the public trust, avoiding impact whenever possible.

OIL AND GAS ACTIVITY

The three alternatives offer the exact same amount of protection for existing and future oil and gas activities on the refuge. The refuge would be protected in the same manner by each alternative from any harmful effects caused by existing oil and gas activity in accordance with Fish and Wildlife Service Policy 603 FW 2 in general, and explicitly under section 2.11D and state and federal laws. Likewise, each alternative would treat requests in the same way for new oil and gas activity as an inappropriate use considering the current status of Louisiana's coastal wetlands and the Fish and Wildlife Service's role in managing and protecting this state's coastal resources.

EFFECTS FROM IMPLEMENTING ALTERNATIVE A – “NO ACTION” (CURRENT MANAGEMENT)

The No-Action Alternative is included in this environmental assessment to provide a basis for comparison with the two action alternatives. Implementing Alternative A would likely be somewhat successful at meeting the primary purpose of Lacassine National Wildlife Refuge. Alternative A would probably not achieve long-range goals over the 15-year life of the comprehensive conservation plan. The No-Action Alternative would maintain the status quo, that is, current management direction. It assumes that current conservation management and land protection programs and activities by the Service, state and local agencies, and private organizations would continue to follow past trends over the next 15 years.

FISH, WILDLIFE, AND HABITAT

The current acreages and proportions (i.e., percentages) of the respective habitat types would generally remain the same under the No-Action Alternative. However, habitat quality, as gauged by its value to waterfowl and most other wildlife, would continue to decline somewhat over the coming

years. Under current passive management, Lacassine Bayou would likely continue to slowly erode from wind and wave action, with declining waterfowl value and reduced water quality, soil loss, and marsh loss.

The fate of Lacassine Pool, like virtually every pond and lake on earth, is not to endure permanently in the landscape as a water body. Over the more than six decades since the pool was created, the ratio of open water to emergent aquatic vegetation has decreased, and it has gradually filled in as emergent aquatic vegetation organic matter (from aquatic vegetation) slowly but steadily accumulated on the bottom. Without active management intervention to disrupt this process of natural succession, it will certainly continue. These interventions, in the form of raising the perimeter levees, some dewatering and some prescribed burning, have forestalled but not reversed the trend. In the future, under the No-Action Alternative, Lacassine Pool is likely to continue gradually filling in as organic matter accumulates on the bottom and reduces pool depth. This long-term process, however, would take much longer than the 15-year life of the comprehensive conservation plan. Habitat for waterfowl, wading birds, marsh birds, alligators, and fish would shrink, and eventually disappear altogether, as the pool becomes a wet meadow over time. Dense emergent vegetation may provide cover for some waterfowl species, but it does not supply the quantity or quality of food that the shallow open-water areas it displaces supplies.

Other valuable wildlife habitats at Lacassine Refuge, such as rice croplands and moist-soil units, would not change appreciably in either acreage or quality under the No-Action Alternative during the coming 15 years. Their value to waterfowl should remain relatively unchanged. Bottomland forests and levee woodlands and shrub habitat may decline in value from ongoing and spreading infestation of invasive plants like Chinese tallow.

PUBLIC USE

In the short term, the No-Action Alternative would maintain and perhaps slightly increase existing public use opportunities. Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation would all continue at present levels or slightly higher. Over the longer term, however, these opportunities may well decline if habitat quality and therefore waterbird usage and the fishery in Lacassine Pool deteriorate. Most of the public use at the refuge takes place at the pool, and the most popular public use, fishing, is focused on the pool. Fishing would at best maintain its level prior to the recent drought, but would more likely decline both in quality of experience, quantity of fish caught, and number of angler days.

Likewise, opportunities for viewing and photographing waterfowl, wading birds, shorebirds, and marsh birds at Lacassine Pool would diminish if the pool continues to fill in. The dense vegetation not only makes it harder to see water birds, but is also attracts fewer of them in the first place. Thus, while this alternative would maintain the wildlife drive, kiosks, observation platform, and levees, there would probably be less wildlife to observe from those vantage points.

Hunting, interpretation, and environmental education are likely to be less affected by these probable unfavorable habitat trends in the pool. Environmental education, both onsite and offsite, could still function effectively, although it may be less interesting to students with fewer large, conspicuous birds or flocks to observe at the refuge. Interpretation, which would focus on describing and explaining the habitat changes underway, would still be effective, although once again, less frequently utilized if overall visitation were to decline from reduced opportunities to view wildlife.

Any decline in visitation to the refuge associated both with decreasing wildlife numbers and opportunities for viewing wildlife, as well as a lower-quality fishery on the pool, would lead to a decline

in the modest economic value of the refuge to the surrounding community. The number of tourists visiting Cameron Parish is likely to increase regardless, taking advantage of such opportunities as the newly established, 180-mile Creole Nature Trail National Scenic Byway and the proximity of the coast, two other national wildlife refuges in Cameron Parish in the Southwest Louisiana Refuge Complex (Sabine and Cameron Prairie), wildlife management areas, and other cultural opportunities. Nonetheless, over time the number of these tourists visiting Lacassine Refuge in particular would probably decline if it were to acquire a reputation for not offering a quality fishing experience and outstanding opportunities to observe and appreciate wildlife. If they are going to go out of their way to visit a wildlife refuge, visitors want to be able to see not just open space but beautiful birds, such as ducks, geese, herons, egrets, roseate spoonbills, rails, bitterns, and perennial favorites like the American alligator.

EFFECTS FROM IMPLEMENTING ALTERNATIVE B – THE “PROPOSED ACTION”

Of the three alternatives evaluated in this environmental assessment, implementing Alternative B is considered to be the most effective management approach for pursuing the purpose of Lacassine National Wildlife Refuge. Alternative B would aim to improve management of the refuge in all program areas. In addition, the refuge would actively pursue purchase of properties from willing sellers within the refuge’s approved acquisition boundary, expanding its size by up to 16,000 acres, that is, from almost 35,000 acres to approximately 51,000 acres.

Under Alternative B, the refuge would redouble its efforts to extend the useful life of Lacassine Pool as a waterfowl sanctuary through adaptive management and increased research and experimentation. The Service would subdivide the pool into three compartments. This action would provide for the growth of *Brasenia* (water shield) and other beneficial waterfowl food plants, create loafing areas for waterfowl, maintain sanctuary for wintering waterfowl, and maintain fisheries habitat. Also, the use and evaluation of prescribed fire as a tool in freshwater marsh management would be stepped up; this action would be facilitated by the proposed subdivision. Moist-soil acreage would increase by 300 to 750 acres, providing additional waterfowl food.

Alternative B would also pursue opportunities to reduce erosion to unimpounded refuge marshes caused by several different natural and human forces, among them wind/wave action, commercial navigation, and oil and gas industry exploration, extraction, and transport activities. Additionally, this alternative would seek resources to control invasive plants in the Wilderness Area and refuge-wide. It would also enhance capabilities at the 334-acre Cajun prairie at Duralde (Vidrine Unit).

In terms of public use, Alternative B would aim to improve quality hunting and fishing experiences and stay at current levels for outreach and environmental education programs.

FISH, WILDLIFE, AND HABITAT

In general, habitats and the fish and wildlife populations they support on the refuge should benefit moderately from Alternative B, to the extent that budgetary and staffing resources allow for its full implementation. Acquiring new property within the refuge’s approved acquisition boundary would enable these lands to be managed so as to increase their habitat value, whether by cooperative farming, installing moist-soil units, reforestation, or marsh restoration, as the case may be. Bottomland hardwood forests (e.g., cypress-tupelo swamp along the fringes of marshes), unimpounded marsh, and the impounded marsh at Lacassine Pool should all be beneficially impacted by this alternative. Restoration of unimpounded marsh at Willow Cutoff could be initiated if the shoreline could be reestablished by proven techniques like terracing, which would improve water quality and habitat for waterfowl, wading birds, and marsh birds.

Lacassine Pool's overall value to both waterfowl, other water-dependent birds, and aquatic species, like fish and the alligator, would be improved and extended under this alternative. Canals would be deepened, the exterior levee might be raised, and prescribed marsh burning would be accelerated, all of which would have the effect of deepening water levels in general, and maintaining or enhancing the open water to emergent vegetation ratio.

Approximately three years out of every ten however, approximately one-third of Lacassine Pool would have to be dewatered and burned under this alternative, in order to prevent the buildup of organic matter that would gradually fill in the pool. This would have a pronounced adverse, but temporary, effect on a substantial portion of the habitat in the pool and a temporary detriment to the bird, fish, and alligator populations found there. However, these impacts would be dispersed through time, since the pool would have been partitioned and subjected to these treatments in portions rather than all at the same time. However, even naturally occurring droughts like the recent one can produce marked adverse effects on the wildlife habitat value of the pool, especially since its only source of water is rainfall.

Acreage of croplands and moist-soil units would be increased under Alternative B. This would lead to a commensurate increase in waterfowl and shorebird food production and the populations of these birds that could be supported by the refuge. Vegetation communities on levees would be improved by controlling invasive weeds and planting trees and shrubs, where appropriate, that have higher wildlife food value, particularly for neotropical migratory birds. Deer may also benefit from these proposed habitat changes and enhancements, particularly because of increased food production on levees, croplands, and moist-soil units.

In general, other wildlife, including other breeding birds, mammals, amphibians, and reptiles, while not specifically targeted by managers, would probably see incidental benefits from most of the proposed habitat management. Of course, whether a given species benefits or not from the proposed changes in management and predicted changes in habitat would depend on its particular ecological niche and habitat needs.

Overall, the proposed approach of subdividing Lacassine Pool into three sub-pools or compartments increases the likelihood of being able to supply the management needed to arrest the succession process and conserve the values and functions of the pool as a wetland; these values and functions include providing for the needs of wintering migratory birds and thereby pursuing the refuge's purpose.

PUBLIC USE

As in the case of the No-Action Alternative, Alternative B fully intends to support and expand public use opportunities, including more facilities, greater staff and volunteer support, and expanded options for wildlife-dependent outdoor recreation and enjoyment. This commitment, coupled with probable increases in populations and visibility of wintering migratory waterfowl, shorebirds, wading birds, marsh birds, and raptors, would furnish greater opportunities for public use and enjoyment of the refuge. Overall, Alternative B would likely be better for public use than Alternative A.

With regard to fishing in Lacassine Pool in particular, the proposed actions would improve fish populations and fishing opportunities during most years. Approximately once every decade at any given site, fishing would be adversely affected in approximately one-third of the pool if treated to reverse the accumulation of organic matter. Roughly three years out of every time, or 30 percent of the time, approximately one-third of the pool would likely be closed to fishing because of low water or

drawdown. More importantly, under Alternative B, fishing could conceivably continue in the pool indefinitely, rather than dwindling over time as the fishery declines in tandem with fish habitat. The proposed maintenance program is necessary to conserve recreational fishing, and other values and functions of the pool, over the long term.

As fishing quality is maintained or improved and as opportunities to observe wildlife increase, the refuge may draw more visitors and offer a more memorable experience. This could interact synergistically with greater wildlife and nature-based tourism in Cameron Parish. Any increase in visitation to the refuge would result in a corresponding increase in the value of the refuge to the local economy, as visitor spending rises.

EFFECTS FROM IMPLEMENTING ALTERNATIVE C – “FOCUS ON POOL MANAGEMENT ONLY”

Under the Secondary Action Alternative, the Lacassine National Wildlife Refuge would remain at 34,724 acres but would reorient management to focus exclusively on actively investigating and extending the life of Lacassine Pool and its value to wintering waterfowl. Thus, Alternative C narrowly interprets the original migratory bird purpose of the refuge. Recognizing the reality of scarce budgetary and personnel resources, it focuses the efforts of staff, maintenance, and capital expenditures only on Lacassine Pool, which continues to serve as a migratory waterfowl sanctuary from October 15 to March 15 every year.

As noted many times in this environmental assessment and the comprehensive conservation plan, because of accumulating organics and constraints on water level management capabilities, Lacassine Pool's effective lifespan is limited. If efforts to forestall ecological succession are insufficient or ineffective, the pool would eventually lose its value both to migratory waterfowl and fish populations. As succession unfolded, it would continue to fill in and become a wet meadow rather than a marshy wetland. To forestall or prevent this eventuality, Alternative C, like Alternative B, proposes to subdivide the pool into sub-pools or compartments. This difference between Alternatives B and C in this regard is that while B would divide the pool into three compartments (plus Unit D), C would divide it into six compartments.

Under Alternative C, the refuge would continue to investigate and finalize strategies to extend the lifespan of the Lacassine Pool, which is 16,000 acres in size and remains the core responsibility of the refuge. Other programs dealing either with non-pool areas of the refuge or non-habitat aspects of refuge management (i.e., cooperative farming, moist-soil management, upland vegetation management, visitor services, and priority public uses) would be managed at a reduced level.

FISH, WILDLIFE, AND HABITAT

In general, within Lacassine Pool, habitats and the fish and wildlife populations they support would benefit from Alternative C. However, elsewhere around the refuge, that is, outside the pool (more than half the refuge area), habitat quantity and quality, as well as fish and wildlife populations, would decline.

Lacassine Pool's overall value to waterfowl and other water-dependent birds and aquatic species, like fish and the alligator, would likely be improved and extended under this alternative, which would subdivide it into six, more manageable compartments. In addition, canals would be deepened, the levee might be raised, prescribed marsh burning would be accelerated, all of which would have the effect of deepening water levels in general, and maintaining or enhancing the open water to emergent vegetation ratio. Also, more research into methods of prolonging the functional life of the pool would

be conducted under Alternative C than under either Alternative A or B, which could yield more effective results.

As with Alternative B, roughly once every ten years, each sub-unit (compartment) of Lacassine Pool would have to be dewatered and burned under Alternative C, in order to prevent the buildup of organic matter that would gradually but inevitably fill in the pool. This would have an adverse, but not long-lived, effect on habitat in the pool, to the temporary detriment of bird, fish, and alligator populations found there. Impacts would be dispersed through time and space from the pool having been partitioned into six sub-pools, which could be subjected to these treatments in sequential or staggered fashion rather than all at the same time. It is probable that Alternative C would disperse impacts on habitat more widely in space and time than would Alternative B. Whereas in Alternative B approximately one-third (33 percent) of the pool's wildlife habitat could be adversely affected from drawdown at any one time, under Alternative C this would usually be approximately one-sixth (17 percent). Since the emphasis of this alternative would be on management of Lacassine Pool for the benefit of wintering waterfowl, there would be no compromise in seasonal water level management in the pool to meet the needs of the fish population and preferences of the fishery.

Under Alternative C, bottomland hardwood forests (e.g., cypress-tupelo swamp along the fringes of marshes) and unimpounded marsh would probably experience some decline in quality and quantity. Restoration of unimpounded marsh at Willow Cutoff would not take place, and so this area's marsh value and water quality would likely continue to degrade, with corresponding adverse impacts on suitability for waterfowl, wading birds, and marsh birds.

Acreage of croplands and moist-soil units would likely decrease somewhat under Alternative B. Thus less food and forage would be produced for waterfowl and shorebirds in the area, with commensurate declines either in the populations of these birds or their nutrition. Vegetation communities on levees would receive less treatment, and would thus be more likely to become further infested with invasive plants, and therefore less valuable to both native birds and mammals.

In sum, migratory birds, fish, and other wildlife and habitat values within Lacassine Pool would improve under this alternative, while those outside the pool would decline.

PUBLIC USE

Alternative C would support public use opportunities on the refuge, but not to the same extent as Alternatives A and B, due to the heightened emphasis on waterfowl habitat management in the pool. All six priority public uses would be allowed and encouraged, as they are at present, but fewer staff and budgetary resources would be allocated to support these uses. Of these six types of activities (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation), use levels of all but fishing are likely to reduce somewhat from present levels. While the refuge's active fishery management efforts in the pool would probably diminish (though not necessarily the state's efforts), fish habitat and populations in the pool are likely to benefit indirectly from endeavors undertaken to extend the functional life of the pool as waterfowl habitat. Anglers would therefore also be indirect beneficiaries, even if reduced efforts are actually expended specifically to encourage and manage sport fishing.

Adverse impacts on sport fishing in Lacassine Pool from the maintenance and management proposed under Alternative C, particularly its subdivision into six compartments and a regular program of drawdown and prescribed fire, would be distributed differently in time than those of Alternative B. That is, under C, roughly one-sixth of the pool would typically be closed to fishing in 6 out of 10 years, rather than one-third being closed three times out of 10 years, as in Alternative B.

Ultimately, over any given decade, the same acreage would be drawn down and burned in the two alternatives, but this acreage would be more dispersed through time in Alternative C.

It is difficult to predict if overall public visitation to Lacassine Refuge would increase or decrease under Alternative C. The answer hinges largely on whether the Lacassine Pool sport fishery would attract less or more anglers than at present, which might or might not offset an expected reduction in the number of outdoor recreationists engaged in the other five priority uses. Thus, the impact of Alternative C on the local economy, whether it would be modestly beneficial or modestly detrimental, is uncertain.

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SECTION C - APPENDICES

Appendix A – Glossary

Adaptive Management	A process in which projects are implemented within a framework of scientifically driven experiments to test predictions and assumptions outlined within the comprehensive conservation plan. The analysis of the outcome of project implementation helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
Alternative	Alternatives are different means of accomplishing refuge purposes, goals, and objectives, and contributing to the National Wildlife Refuge System. A reasonable way to fix the identified problem or satisfy the stated need.
Approved Acquisition Boundary	A project boundary which the Director of the Fish and Wildlife Service approves upon completion of a detailed planning and environmental compliance process.
Bayou	A minor river or secondary watercourse, usually sluggish or back flooding water flow.
Beneficial Dredge	Also know as beneficial use of dredge material. Material dredged (removed) from waterways used in a positive manner. (See Pumped and Excavated Dredge.)
Biological Diversity	The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. The National Wildlife Refuge System focus is on indigenous species, biotic communities, and ecological processes.
Brackish Marsh	An area of soft, wet, low-lying land characterized by grassy-vegetation and water containing some salt, but less than seawater.
Categorical Exclusion	A category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a federal agency pursuant to the National Environmental Policy Act.
CFR	Code of Federal Regulations.

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)	Passed in 1990, by Congress, this act funds wetland enhancement projects to preserve and restore Louisiana’s coastal landscape. The act is also known as the “Breux Act.”
Colonial Waterbirds	Waterbird families generally containing seabirds, coastal waterbirds, and wading birds that congregate at breeding sites in numbers ranging from many to hundreds of thousands of birds.
Compatibility Determination	A required determination for wildlife-dependent recreational uses or any other public uses of a refuge.
Compatible Use	A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the refuge manager, will not materially interfere with, or detract from, the fulfillment of the mission or the purposes of the refuge. A compatibility determination supports the selection of compatible uses and identifies stipulations or limits necessary to ensure compatibility.
Comprehensive Conservation Plan (CCP)	A document that describes the desired future conditions of the refuge; provides long-range guidance and management direction for the refuge manager to accomplish the purposes, goals, and objectives of the refuge; and contributes to the mission of the National Wildlife Refuge System, and to meet relevant mandates.
Cooperative Agreement	A simple habitat protection action in which no property rights are acquired. An agreement is usually long-term and can be modified by either party. Lands under a cooperative agreement do not necessarily become part of the National Wildlife Refuge System.
CRMP	Cultural Resources Management Plan
Cultural Resources	The remains of sites, structures, or objects used by people of the past.
Duck Season Split	A planned interruption during the 60-day hunting season to extend the season to allow hunting when waterfowl are still abundant.
Early Successional Wetland	Wetlands managed for the production of annual plants that produce both vegetation and seeds for use by geese, ducks, and other wetland bird species. (See also Moist-Soil Management.)

Ecological Succession	The orderly progression of an area through time in the absence of disturbance from one vegetative community to another.
Ecosystem	A dynamic and interrelating complex of plant and animal communities and their associated non-living environment.
Ecosystem Management	Management of natural resources using system-wide concepts to ensure that all plants and animals in ecosystems are maintained at viable levels in native habitats and basic ecosystem processes are perpetuated indefinitely.
Ecotone	A transitional zone between two communities containing the characteristic species of each.
Ecotourism	Visits to an area that maintains and conserves natural resources as a basis for promoting its economic growth and development.
Emergent Marsh	Wetlands dominated by erect, rooted, herbaceous plants.
Endangered Species	A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
Environmental Assessment	A concise document prepared in compliance with the National Environmental Policy Act that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact.
Environmental Education	A process of building knowledge in students through hands-on activities that promotes discovery and fact-finding. It involves the integration of environmental concepts and concerns into structured educational activities.
ESA	Endangered Species Act
Excavated Dredge	Removal of material from a waterway bottom using excavating equipment. The dredged material is usually high in clay content and can be used for the creation of levees or earthen terraces. See beneficial dredge.
Fauna	All the vertebrate or invertebrate animals of an area.

Federal Trust Species	All species where the Federal Government has primary jurisdiction, including federally threatened or endangered species, migratory birds, anadromous fish, and certain marine mammals.
Fee-Title	The acquisition of most or all of the rights to a tract of land. There is a total transfer of property rights with the formal conveyance of a title. While a fee title acquisition involves most rights to a property, certain rights may be reserved or not purchased, including water rights, mineral rights, or use reservation (the ability to continue using the land for a specified time period, or the remainder of the owner's life).
Finding of No Significant Impact	A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, which briefly presents why a federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared.
Fire Regime	The characteristic frequency, intensity, and spatial distribution of natural fires within a given ecoregion or habitat.
Geographic Information System (GIS)	A computer system capable of storing and manipulating spatial data.
GCJV	Gulf Coast Joint Venture
Goal	Descriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but does not define measurable units.
Grassland birds	These birds use prairie habitat to meet their biological needs. This group of birds includes over 300 species and over 75 percent of the breeding bird species of the United States.
GIW	Gulf Intracoastal Waterway
Hemi-marsh	Areas of mixed open water and emergent vegetation at a ratio of one part open water to one part vegetation preferred by many species of wildlife. Interspersed areas of dense emergent vegetation provide nesting areas and cover for many species.
Herbaceous Wetland	Annually or seasonally inundated with vegetation consisting primarily of grasses, sedges, rushes, and cattail.

Habitat	The place where an organism lives. The existing environmental conditions required by an organism for survival and reproduction.
Impoundment	A body of water, such as a pool, confined by a levee or other barrier, which is used to maintain a freshwater marsh area. Rainfall is usually the only means of providing water into the area.
Indicator Species	A species of plant or animals that is assumed to be sensitive to habitat changes and represents the needs of a larger group of species.
In-Holding	Privately owned land inside the boundary of a national wildlife refuge.
Intermediate marsh	This marsh type is found on the sea-ward of freshwater areas. Intermediate marsh is characterized by a diversity of species, many of which can be found in both freshwater and brackish marshes. Plants found in these marshes can tolerate slightly salty water. Intermediate marshes are also important for waterfowl, wading birds, and furbearers, and provide nursery habitat for brown shrimp, blue crab, and a variety of other commercially and recreationally valuable fishery resources.
Interpretation	A teaching technique that combines factual with stimulating explanatory information.
Invasive species	An alien species whose establishment does, or is likely to, cause economic or environmental harm.
Inventory	Accepted biological methods to determine the presence, relative abundance, and distribution of species.
Issue	Any unsettled matter that requires a management decision.
Kiosk	A small structure with one or more open sides that is used to display or provide information.
LCA	Louisiana Coastal Area Ecosystem Restoration Plan
LDWF	Louisiana Department of Wildlife and Fisheries
LMRE	Lower Mississippi River Ecosystem

Maintenance Management System (MMS)	The Maintenance Management System is a national database and management tool used for planning and budgeting unfunded maintenance, improvements, repairs, replacement, and construction projects required for on-going support of resource management.
Migratory	The seasonal movement from one area to another and back.
Moist-Soil Unit Management	Refers to the way water is used to create a desired plant community habitat. This habitat is manually disturbed using mechanical equipment, tractors and disk. Following this disturbance, native plant seeds already existing within the soil are allowed to germinate and then the soil is flooded to a shallow depth. Once plants reach maturity, fields are again disturbed to create a 50:50 ratio of open water to standing vegetation. (See early successional wetland.)
Monitoring	The process of collecting information to track changes of selected parameters over time.
National Environmental Policy Act	Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this act with other planning requirements, and prepare appropriate policy documents to facilitate better environmental decision-making.
National Wildlife Refuge (NWR)	A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System.
National Wildlife Refuge System	Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas.
Native Species	Species that normally live and thrive in a particular ecosystem.
Neotropical Migratory Bird	A bird species that breeds north of the United States and Mexican border and winters primarily south of that border, which includes Mexico, West Indies, Central America, and part of South America.

Natural Levee	Natural embankment created by soil deposited as a stream overtops its banks. Located adjacent to a stream, a natural levee is often the highest ground in a bottomland or swamp type area.
Non-game migratory landbirds	Commonly known as Nearctic-Neotropical Migratory Birds, these birds breed in temperate latitudes but winter in tropical latitudes.
NORM	Naturally Occurring Radioactive Material
NWR	National Wildlife Refuge
Objective	An objective is a concise quantitative (where possible) target statement of what will be achieved. Objectives are derived from goals and provide the basis for determining management strategies. Objectives should be attainable and time-specific.
Parish	An administrative district in Louisiana, corresponding to a county in other states.
Planning Area	A planning area may include lands outside existing refuge planning unit boundaries that are being studied for inclusion in the unit and partnership planning efforts. It may also include watersheds or ecosystems that affect the planning area.
Planning Team	A planning team prepares the comprehensive conservation plan. Planning teams are interdisciplinary in membership and function. A team generally consists of the a planning team leader; refuge manager and staff biologists; staff specialists or other representatives of Service programs, ecosystems or regional offices; and state partnering wildlife agencies as appropriate.
Prescribed Burn	Fire intentionally ignited by refuge fire personnel for natural resource management under strict guidelines to meet specific objectives.
Pumped Dredge	As shipping channels need to be maintained for depth to allow for passage of large vessels, it is necessary to remove accumulated material from the bottom. A suction dredge brings the fine organic material to the surface where a pump system mixes the material with water and creates a slurry. This slurry can be used in coastal restoration projects to replace material lost in open-water marsh areas. See beneficial dredge.

Refuge Boundary	Lands acquired by the Fish and Wildlife Service within the current approved acquisition boundary.
Refuge Complex	Four National Wildlife Refuges which include Cameron Prairie, Lacassine, Sabine and Shell Keys were administratively combined into the Southwest Louisiana National Wildlife Refuge Complex. Complexing allows for better management oversight.
Refuge Operating Needs System (RONS)	This is a national database which contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates.
Refuge Purposes	The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge sub-unit.
SAMMS	Service Asset Maintenance Management System
Seismic survey	A means of gathering subsurface geological information through the generation and receipt of impulses from an artificially generated shockwave (usually a dynamite charge), which predicts oil and gas deposits for further exploration.
Source	A habitat in which local reproductive success exceeds local mortality for a given species.
Source Population	A population in a high-quality habitat in which birth rate greatly exceeds death rate and the excess individuals leave as migrants.
Step-Down Management Plans	Step-down management plans provide the details necessary to implement management strategies and projects identified in the comprehensive conservation plan.
Strategy	A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives.
Survey	A general term for any type of inventory or monitoring procedure.
Threatened Species	Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

TGCE	Texas Gulf Coast Ecosystem
Undesirable Species	A plant or animal species whose introduction does or is likely to cause economic or environmental harm, or harm to human health. These species can be native or non-native.
Water Buffalo	The use of mechanized farm equipment in combination with land rolling equipment to improve seed-soil contact, as well as to pulverize soil aggregates and leave a smooth surface.
Wildlife-Dependent Recreation	A use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority general public uses of the system.
Wildland Fire	A fire that is caused naturally (lighting strike) or human caused that is unwanted.

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Appendix B – References and Literature Citations

- American Bird Conservancy. 2000. Partners in Flight, Conservation of the Land Birds of the United States.
- Barras, J. A., S. Beville, D. Britsch, S. Hartley, S. Hawes, J. Johnston, P. Kemp, Q. Kinler, A. Martucci, J. Porthouse, D. Reed, K. Roy, S. Sapkota, and J. Suhayda. 2003. Historical and projected coastal Louisiana land changes: 1978-2050: USGS Open File Report 03-334.
- Brown, S.; C. Hickey; B. Harrington; and R. Gills, eds. 2001. The U.S. Shorebird Conservation Plan, 2nd ed. Manomet Center for Conservation Sciences, Manomet, MA.
- Chabreck, R. H. 1997. Experimental Dewatering of Unit D on Lacassine National Wildlife Refuge. Report submitted to U.S. Fish and Wildlife Service. 19 pp.
- Chenier Plain Initiative Team. 1990. Chenier Plain Initiative, Texas and Louisiana Gulf Coast Joint Venture, North American Waterfowl Management Plan.
- Couser, D. 2002. Atakapa Indians. Handbook of Texas Online. <http://www.tsha.utexas.edu/handbook/online/articles/view/AA/bma48.html> .
- Cox, R.R.; Afton, A.D. 1996. Evening Flights of Female Northern Pintails from a Major Roost Site. The Condor 98: 810 – 819.
- Esslinger, C.G. and B.C. Wilson. 2001. North American Waterfowl Management Plan, Gulf Coast Joint Venture: Chenier Plain Initiative. North American Waterfowl Management Plan, Albuquerque, N.M. 28pp + appendix.
- Feldman, L.H. 1998. The Last Days of British Saint Augustine, 1784-1785. A Spanish Census of the English Colony of East Florida
- Fruge, D.W. 1974. Report of Wildlife Management Study. Final Report. The Vegetation of Lacassine Pool, Lacassine National Wildlife Refuge, Louisiana. U.S. Fish and Wildlife Service, Lafayette, LA. 50 pp.
- Gulf Coast Prairie Working Group, Mississippi Alluvial Valley/West Gulf Coastal Plain Working Groups. 2000. U.S. Shorebird Conservation Plan, Lower Mississippi/Western Gulf Coast Shorebird Planning Region.
- Hebert, T. 2003. "The First Acadians in New Acadia, 1764-1784." History of the Cajuns: Cajuns in the 18th Century. <http://www.acadian-cajun.com/hiscaj2b.htm> . Acadian-Cajun Genealogy and History.
- Kushlan, J.A.; M.J. Steinkamp; K.C. Parsons; J. Capp; M.A. Cruz; M. Coulter; I. Davidson; L. Dickson; N. Edelson; R. Elliot; R.M. Erwin; S. Hatch; S. Kress; R. Milko; S. Miller; K. Mills; R. Paul; R. Phillips; J.E. Saliva; B. Sydeman; J. Trapp; J. Wheeler; and K. Wohl. 2002. Waterbird

Conservation for the Americas: The North American Waterbird Conservation Plan, Version I. Waterbird Conservation for the Americas, Washington, D.C.

- Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. Coast 2050: Toward a Sustainable Coastal Louisiana. Louisiana Department of Natural Resources. Baton Rouge, LA. 161p.
- North American Waterfowl Management Plan. 2001. Gulf Coast Joint Venture: Chenier Plain Initiative. August.
- North American Waterfowl Management Plan. 1991. Louisiana Waterfowl Action Plan, A Strategy for Implementing the North American Waterfowl Management Plan in Louisiana.
- Royal Café. No date. The distinction between Cajun and Creole. Accessed on the World Wide Web at <http://www.royalcafe.com/cc.html>.
- (STATS Indiana, 2004) Indiana Department of Commerce. 2004. USA Counties IN Profile. Accessed at: http://www.stats.indiana.edu/uspr/a/usprofiles/22/us_over_sub_pr22023.html .
- Swenson, E.M. and R.E. Turner. 1987. Spoil banks: Effects on a coastal marsh on coastal marsh water-level regime. *Estuarine, Coastal and Shelf Science* 24, 599-609.
- (TNC, 2003). The Nature Conservancy. 2003. Wildland Invasive Species Team, Invasives on the Web. Website accessed on February 2004: <http://tncweeds.ucdavis.edu/esadocs/documnts/sapiseb.html> .
- U.S. Army Corps of Engineers. 2004. Louisiana Coastal Area, Louisiana – Ecosystem Restoration Study – July 2004. Draft Report.
- (USCB, 2004) U.S. Census Bureau. 2004. Louisiana QuickFacts: Cameron Parish. Accessed at: <http://quickfacts.census.gov/qfd/states/22/22023.html> .
- (USFWS 2006). U.S. Fish and Wildlife Service. 2006. Lacassine National Wildlife Refuge. Waterfowl Survey Files.
- (USFWS, 2004) U.S. Fish and Wildlife Service. 2004. Lacassine National Wildlife Refuge. Accessed: January 2004. Accessed at <http://lacassine.fws.gov> .
- (USFWS, 2003). U.S. Fish and Wildlife Service. 2003. Lacassine National Wildlife Refuge, Wildlife and Habitat Management (Biological) Review, May 20-24, 2002
- (USFWS, 2002a) U.S. Fish and Wildlife Service. 2002. *Birds of Conservation Concern 2002* (BCC 2002). Division of Migratory Bird Management, Arlington, Virginia.
- (USFWS, 2002b) U.S. Fish and Wildlife Service. 2002. Lacassine National Wildlife Refuge Bird List.
- (USFWS, 2002c). U.S. Fish and Wildlife Service. 2002. Lacassine National Wildlife Refuge. Public Use Review report. Region 4.
- (USFWS 2002d) U.S. Fish and Wildlife Service. 2002. Lacassine National Wildlife Refuge Biological Review Briefing Book. U.S. Fish and Wildlife Service.

-
- (USFWS 2000). U.S. Fish and Wildlife Service. 2000. Lacassine National Wildlife Refuge. Annual Narrative Report, Calendar Year 1999.
- (USFWS 1998). U.S. Fish and Wildlife Service. 1998. Lacassine National Wildlife Refuge. Annual Narrative Report, Calendar Year 1997.
- (USFWS 1998). U.S. Fish and Wildlife Service. 1998. Expanding the Vision, 1998 Update, North American Waterfowl Management Plan.
- (USFWS 1997). U.S. Fish and Wildlife Service. 1997. Lacassine National Wildlife Refuge. Brochure. November.
- (USFWS 1995). U.S. Fish and Wildlife Service. 1995. Lacassine National Wildlife Refuge. Comprehensive Plan to Resolve Resource Problems
- (USFWS 1995). U.S. Fish and Wildlife Service. 1995. Lacassine National Wildlife Refuge. Cropland Management Plan.
- (USFWS 1993). U.S. Fish and Wildlife Service. 1993. Refuges 2003, Draft Environmental Impact Statement, A Plan for the Future of the National Wildlife Refuge System.
- (USFWS 1993). U.S. Fish and Wildlife Service. 1993. Lacassine National Wildlife Refuge. Alligator Harvest Plan.
- (USFWS 1993). U.S. Fish and Wildlife Service. 1993. Vidrine FmHA Fee Title Management Plan.
- (USFWS, 1990) U.S. Fish and Wildlife Service. 1990. American Woodcock Management Plan. U.S. Fish and Wildlife Service, Washington, D.C.
- (USFWS, 1989a) U.S. Fish and Wildlife Service. 1989a. Birds of Lacassine National Wildlife Refuge. U.S. Fish and Wildlife Service. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. Accessed at: <http://www.npwrc.usgs.gov/resource/othrdata/chekbird/r4/lacassine.htm> .
- (USFWS 1989b). U.S. Fish and Wildlife Service. 1989b. Lacassine National Wildlife Refuge. Fishing Plan.
- (USFWS 1987). U.S. Fish and Wildlife Service. 1987. Lacassine National Wildlife Refuge. Oil and Gas Management Plan.
- (USFWS 1986). U.S. Fish and Wildlife Service. 1986. Lacassine National Wildlife Refuge. Comprehensive Plan to Resolve Resource Problems.
- (USFWS 1985). U.S. Fish and Wildlife Service. 1985. Lacassine National Wildlife Refuge. Public Use Development Plan.
- (USFWS 1985), U.S. Fish and Wildlife Service. 1985. Lacassine National Wildlife Refuge. Wilderness Management Plan.
- (USFWS 1984). U.S. Fish and Wildlife Service. 1984. Lacassine National Wildlife Refuge. Hunting Plan.

-
- (USFWS 1983). U.S. Fish and Wildlife Service. 1983. Lacassine National Wildlife Refuge. Commercial Trapping Plan.
- (USFWS 1982). U.S. Fish and Wildlife Service. 1982. Lacassine National Wildlife Refuge. Fishery Management Plan.
- (USFWS No Date a) U.S. Fish and Wildlife Service. No Date. Bayou Cocodrie Draft Comprehensive Conservation Plan and Environmental Assessment.
- (USFWS No Date b). U.S. Fish and Wildlife Service. No Date. Natural Resource Management Priorities of the U.S. Fish and Wildlife Service along the Texas Gulf Coast.
- (USFWS No Date c) U.S. Fish and Wildlife Service. No Date. Southwest Louisiana Lease Areas Management Plan.
- U.S. NABCI Committee. 2000. The North American Bird Conservation Initiative in the United States: A Vision of American Bird Conservation.
- Valentine, J. M. 1979. Report of Wildlife Management Study. Vegetation Succession on the Lake Misere Marsh. U.S. Wildlife Service, Lafayette, LA. 17 pp.
- Vogl, Richard J. 1973. Effects of fire on the plants and animals of a Florida wetland. *American Midland Naturalist*. 89: 334-347.
- Wang, J.D. 1987. Hurricane effects on surface Gulf Stream currents. *Ocean Engr*14(3): 165-180.
- Wilson, B.C. and C.G. Esslinger. 2002. North American Waterfowl Management Plan, Gulf Coast Joint Venture: Texas Mid-Coast Initiative. North American Waterfowl management Plan, Albuquerque, NM. 28pp + appendix.

Appendix C – Legal Mandates

This comprehensive conservation plan and environmental assessment has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA). NEPA requires federal agencies to consider all environmental factors related to their proposed actions. The Environmental Assessment discloses and explains both favorable and unfavorable consequences of a particular action that is being contemplated by a federal agency. This includes effects on the natural, economic, social, and cultural resources of the area.

The Service will comply with the following laws and regulations prior to, during, and following implementation of the comprehensive conservation plan.

National Wildlife Refuge System Authorities:

Emergency Wetlands Resources Act (1986): The purpose of the act is “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.”

Emergency Wetland Resources Act of 1986: This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The act also requires the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan, requires the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund an amount equal to import duties on arms and ammunition.

Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended: Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 act amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926): The 1973 Endangered Species Act provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through federal action and by encouraging the establishment of state programs. The act authorizes the determination and listing of species as threatened and endangered; prohibits unauthorized taking, possession, sale, and transport of endangered species; provides authority to acquire land for the conservation of listed species, using land and water conservation funds; authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for threatened and endangered wildlife and plants; authorizes the assessment of civil and criminal penalties for violating the act or regulations; and authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction of anyone violating the act and any regulation issued there under.

Endangered Species Act (1973): Requires all federal agencies to carry out programs for the conservation of threatened and endangered species.

Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996): Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the system.

Fish and Wildlife Act (1956): Established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

Fish and Wildlife Coordination Act (1958): Allows the Fish and Wildlife Service to enter into agreement with private landowners for wildlife management purposes.

Fish and Wildlife Improvement Act of 1978: This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary of the Interior to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.

Land and Water Conservation Fund Act of 1948: This act provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources of land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.

Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718-718j, 48 Stat. 452), as amended: The "Duck Stamp Act," of March 16, 1934, requires each waterfowl hunter, 16 years of age or older, to possess a valid federal hunting stamp. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations.

Migratory Bird Treaty Act (1918): Designates the protection of migratory birds as a federal responsibility. This act enables the setting of seasons, and other regulations including the closing of areas, federal or non-federal, to the hunting of migratory birds.

Migratory Bird Conservation Act (1929): Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Migratory Bird Hunting and Conservation Stamp Act (1934): Authorized the opening of part of a refuge to waterfowl hunting.

National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee. (Refuge Administration Act): Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the refuge system; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography and environmental education and interpretation); establishes a formal process for determining compatibility; established the responsibilities of the Secretary of the Interior for managing and protecting the system; and requires a comprehensive conservation plan for each refuge by the year 2012. This act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

National Wildlife Refuge System Improvement Act of 1997: Public Law 105-57, amended the National Wildlife Refuge System Act of 1966 (16 U.S.C. 668dd-ee): Provided guidance for management and public use of the refuge system. The act mandates that the refuge system be consistently directed and managed as a national system of lands and waters devoted to wildlife conservation and management. The act establishes priorities for recreational uses of the Refuge System. Six wildlife-dependent uses are specifically named in the act: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. These activities are to be promoted on

the Refuge System, while all non-wildlife-dependent uses are subject to compatibility determinations. A compatible use is one which, in the sound professional judgment of the refuge manager, will not materially interfere with, or detract from, fulfillment of the National Wildlife Refuge System mission or refuge purpose(s). As stated in the act, “The mission of the 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.” The act also requires development of a comprehensive conservation plan for each refuge and that management be consistent with the plan. When writing a plan for expanded or new refuges, and when making management decisions, the act requires effective coordination with other federal agencies, state fish and wildlife or conservation agencies, and refuge neighbors. A refuge must also provide opportunities for public involvement when making a compatibility determination.

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401~4412) Public Law 101-233, enacted December 13, 1989: Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on Wetlands between Canada, the United States and Mexico. The act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006, to carry out the programs authorized by the act, along with an authorization for annual appropriation of \$15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act. Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States’ share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year.

Refuge Recreation Act of 1952: This act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area’s primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Refuge Recreation Act (1962): Allows the use of refuges for recreation when such uses are compatible with the refuge’s primary purposes and when sufficient funds are available to manage the use Land and Water Conservation Fund Act (1965): Uses the receipts from the sale of surplus federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

Refuge Revenue Sharing Act (16 U.S.C. 715s) Section 401 of the Act of June 15, 1935, (49 Stat. 383): Provided for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges. Public Law 88-523, approved August 30, 1964, (78 Stat. 701) made major revisions by requiring that all revenues received from refuge products, such as animals, timber and minerals, or from leases or other privileges, be deposited in a special Treasury account and net receipts distributed to counties for public schools and roads. Public Law 93-509, approved December 3, 1974, (88 Stat. 1603) required that moneys remaining in the fund after payments be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act. Public Law 95-469, approved October 17, 1978, (92 Stat. 1319) expanded the revenue sharing system to include National Fish Hatcheries and Service research stations. It also included in the Refuge Revenue Sharing Fund receipts from the sale of salmonid carcasses. Payments to counties were established as follows: on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent

of the net receipts produced from the land; and on land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601-1607, 90 Stat. 2662). This amendment also authorized appropriations to make up any difference between the amount in the fund and the amount scheduled for payment in any year. The stipulation that payments be used for schools and roads was removed, but counties were required to pass payments along to other units of local government within the county which suffer losses in revenues due to the establishment of Service areas.

Wilderness Act of 1954: 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 for inclusion in the National Wilderness Preservation System.

U.S. Fish and Wildlife Service Manual:

Fish and Wildlife Service Manual: 612 FW 2, Oil and Gas ; FWM#: 107 (new), Series: Natural and Cultural Resources Management, Part 612: Minerals Management. This chapter provides standard policy guidance and background information on management of oil and gas activities on Service lands and provides the basic information regarding the statutes, regulations, and procedures relating to all oil and gas activities conducted on Service lands. The policy of the Service is governed by authorities for leasing oil and gas on Federal lands as found in the Mineral Leasing Act for Acquired Lands of August 7, 1947, as amended; for public domain lands, the Mineral Leasing Act of February 25, 1920, as amended; and in Alaska, Section 1008 of the Alaska National Interest Lands Conservation Act (16 U.S.C. 3148). Leasing is at the discretion of the Secretary of the Interior who has delegated the Bureau of Land Management authority to administer the laws, but has by regulation restricted oil and gas leasing on lands of the National Wildlife Refuge System to those involving drainage (43 CFR 3101.5-1 and 3100.2). In conformance with the policy set forth in 50 CFR 27 (National Wildlife Refuge System), 50 CFR 60.3 (Patuxent Wildlife Research Center), and 50 CFR 70.4 (National Fish Hatcheries), the Service usually recommends against leasing when the Bureau of Land Management asks for comments. In the case of non-federally owned oil and gas rights, it is the policy of the Service to protect project resources to the maximum extent possible without infringing upon the rights of sub-surface owners.

Historic Preservation Mandates:

Antiquities Act (1906): Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Antiquities Act (16 USC 431 - 433): The Act of June 8, 1906, (34 Stat. 225): Authorizes the President of the United States to designate as National Monuments objects or areas of historic or scientific interests on lands owned or controlled by the United States. The act required that a permit be obtained for examination of ruins, excavation of archaeological sites and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

Archaeological and Historic Preservation Act (16 U.S.C. 469-469c): Public Law 86-523, approved June 27, 1960, (74 Stat. 220), and amended by Public Law 93-291, approved May 24, 1974, (88 Stat. 174): Directed federal agencies to notify the Secretary of the Interior whenever a federal, federally assisted, or licensed or permitted project may cause loss or destruction of significant scientific, prehistoric or archaeological data. The act authorized use of appropriated, donated, or transferred funds for the recovery, protection, and preservation of such data.

Archaeological Resources Protection Act (16 U.S.C. 470aa - 47011): Public Law 96-95, approved October 31, 1979, (93 Stat. 721) largely supplanted the resource protection provisions of the Antiquities Act for archaeological items. This act established detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from federal and Indian lands. It also established civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from federal and Indian lands in violation of any provision of federal law; and for interstate and foreign commerce in such resources acquired, transported or received in violation of any state or local law.

Executive Order 13007, Indian Sacred Sites (1996): Directs Federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

Historic Sites, Buildings and Antiquities Act (16 U.S.C. 461-462, 464467): The Act of August 21, 1935, (49 Stat. 666) popularly known as the Historic Sites Act, as amended by Public Law 89-249, approved October 9, 1965, (79 Stat. 971), declared it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provided procedures for designation, acquisition, administration and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this Act. As of January 1989, thirty-one national wildlife refuges contained such sites.

National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n) Public Law 89-665, approved October 15, 1966, (80 Stat. 915) and repeatedly amended: Provided for preservation of significant historical features (buildings, objects and sites) through a grant-in-aid program to the states. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468468d).

The act established an Advisory Council on Historic Preservation, which was made a permanent independent agency in Public Law 94 422, approved September 28, 1976 (90 Stat. 1319). That act also created the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed in, or eligible for listing in, the National Register of Historic Places. As of January 1989, ninety-one such sites on national wildlife refuges are listed in this Register.

Public Law 100-588, approved November 3, 1988, (102 Stat. 2983): Lowered the threshold value of artifacts triggering the felony provisions of the act from \$5,000 to \$500, made attempting to commit an action prohibited by the act a violation, and required the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the nation.

National Environmental Policy Act of 1969:

National Environmental Policy Act of 1959 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852) as amended by Public Law 94-52, July 3, 1975, 89 Stat. 258, and Public Law 94-83, August 9, 1975, 89 Stat. 424). Title I of the 1969 National Environmental Policy Act: Requires that all federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." The 1969 statute stipulated the factors to be considered in environmental impact statements, and required that federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unquantified environmental values are given appropriate consideration, along with economic and technical considerations. Title II of this statute

requires annual reports on environmental quality from the President to the Congress, and established a Council on Environmental Quality in the Executive Office of the President with specific duties and functions.

Other Relevant Legal Mandates:

American Conservation and Youth Service Corps: A Federal grant program established under Subtitle C of the law, the Corps offers an opportunity for young adults between the ages of 16-25, or in the case of summer programs, 15-21, to engage in approved human and natural resources projects which benefit the public or are carried out on federal or Indian lands. To be eligible for assistance, natural resource programs must focus on improvement of wildlife habitat and recreational areas, fish culture, fishery assistance, erosion, wetlands protection, pollution control and similar projects. A stipend of not more than 100 percent of the poverty level will be paid to participants. A Commission established to administer the Youth Service Corps will make grants to States, the Secretaries of Agriculture and Interior and the Director of ACTION to carry out these responsibilities.

Americans With Disabilities Act (1992): Prohibits discrimination in public accommodations and services.

Architectural Barriers Act (1968): Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

Clean Water Act (1977): Requires consultation with the U.S. Army Corps of Engineers for major wetland modifications.

Environmental Education Act of 1990(20 USC 5501-5510; 104 Stat. 3325): Public Law 101-619, signed November 16, 1990: Established the Office of Environmental Education within the Environmental Protection Agency to develop and administer a Federal environmental education program. Responsibilities of the office include developing and supporting programs to improve understanding of the natural and developed environment, and the relationships between humans and their environment; supporting the dissemination of educational materials; developing and supporting training programs and environmental education seminars; managing a federal grant program; and administering an environmental internship and fellowship program. The office is required to develop and support environmental programs in consultation with other federal natural resource management agencies, including the Fish and Wildlife Service.

Executive Order 11988, Flood plain Management: The purpose of this Executive Order, signed May 24, 1977, is to prevent federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of flood plain development.” In the course of fulfilling their respective authorities, 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 flood plains.”

Federal Noxious Weed Act (1990): Requires the use of integrated management systems to control or contain undesirable plant species; and an interdisciplinary approach with the cooperation of other federal and state agencies.

National and Community Service Act of 1960 (42 U.S.C. 12401:104 Stat. 3127), Public Law 101-610, signed November 16, 1990: Authorizes several programs to engage citizens of the United States in full or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance

educational skills, and fulfill environmental needs. Several provisions are of particular interest to the Fish and Wildlife Service.

Rehabilitation Act (1973): Requires that programmatic and physical accessibility be made available in any facility funded by the Federal Government, ensuring that anyone can participate in any program.

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Appendix D – Biota

Species previously identified as occurring on Lacassine National Wildlife Refuge are listed below:

Common Name	Scientific Name
Birds	
Grebes	
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Horned Grebe	<i>Podiceps auritus</i>
Pelicans and their Allies	
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>
Anhinga	<i>Anhinga anhinga</i>
Hérons, Egrets, and Allies	
American Bittern	<i>Botaurus lentiginosus</i>
Least Bittern	<i>Ixobrychus exilis</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Ardea alba</i>
Snowy Egret	<i>Egretta thula</i>
Little Blue Heron	<i>Egretta caerulea</i>
Tricolored Heron	<i>Egretta tricolor</i>
Reddish Egret	<i>Egretta rufescens</i>
Cattle Egret	<i>Bubulcus ibis</i>
Green Heron	<i>Butorides virescens</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
Yellow-crowned Night-Heron	<i>Nycticorax violacea</i>
Ibis, Spoonbill, and Stork	
Glossy Ibis	<i>Plegadis falcinellus</i>
White Ibis	<i>Eudocimus albus</i>
White-faced Ibis	<i>Plegadis chihi</i>
Roseate Spoonbill	<i>Platalea ajaia</i>
Wood Stork	<i>Mycteria americana</i>
Sandhill Crane	<i>Grus canadensis</i>
Waterfowl	
Fulvous Whistling-Duck	<i>Dendrocygna bicolor</i>
Black-bellied Whistling Duck	<i>Dendrocygna autumnalis</i>
Greater White-fronted Goose	<i>Anser albifrons</i>
Snow Goose	<i>Chen caerulescens</i>
Ross's Goose	<i>Chen rossii</i>
Canada Goose	<i>Branta canadensis</i>
Wood Duck	<i>Aix sponsa</i>
Green-winged Teal	<i>Anas crecca</i>
American Black Duck	<i>Anas rubripes</i>
Mottled Duck	<i>Anas fulvigula</i>
Mallard	<i>Anas platyrhynchos</i>
Northern Pintail	<i>Anas acuta</i>
Blue-winged Teal	<i>Anas discors</i>
Cinnamon Teal	<i>Anas cyanoptera</i>
Northern Shoveler	<i>Anas clypeata</i>
Gadwall	<i>Anas strepera</i>
American Wigeon	<i>Anas americana</i>
Canvasback	<i>Aythya valisineria</i>

Redhead	<i>Aythya americana</i>
Ring-necked Duck	<i>Aythya collaris</i>
Greater Scaup	<i>Aythya marila</i>
Lesser Scaup	<i>Aythya affinis</i>
Common Goldeneye	<i>Bucephala clangula</i>
Bufflehead	<i>Bucephala albeola</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Common Merganser	<i>Mergus merganser</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
Vultures, Hawks, and Allies	
Black Vulture	<i>Coragyps atratus</i>
Turkey Vulture	<i>Cathartes aura</i>
Osprey	<i>Pandion haliaetus</i>
White-tailed Kite	<i>Elanus leucurus</i>
Mississippi Kite	<i>Ictinia mississippiensis</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Northern Harrier	<i>Circus cyaneus</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Broad-winged Hawk	<i>Buteo platypterus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Crested Caracara	<i>Caracara cheriway</i>
Gallinaceous Birds (Quail, Turkey, and Allies)	
Northern Bobwhite Quail	<i>Colinus virginianus</i>
Rails, Gallinules, Coots, and Cranes	
Yellow Rail	<i>Coturnicops noveboracensis</i>
King Rail	<i>Rallus elegans</i>
Virginia Rail	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
Purple Gallinule	<i>Porphyrio martinica</i>
Common Moorhen	<i>Gallinula chloropus</i>
American Coot	<i>Fulica americana</i>
Shorebirds	
Black-bellied Plover	<i>Pluvialis squatarola</i>
American Golden-Plover	<i>Pluvialis dominica</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Killdeer	<i>Charadrius vociferus</i>
Black-necked Stilt	<i>Himantopus mexicanus</i>
American Avocet	<i>Recurvirostra americana</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Upland Sandpiper	<i>Bartramia longicauda</i>
Whimbrel	<i>Numenius phaeopus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Marbled Godwit	<i>Limosa fedoa</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Red Knot	<i>Calidris canutus</i>

Sanderling	<i>Calidris alba</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
Western Sandpiper	<i>Calidris mauri</i>
Least Sandpiper	<i>Calidris minutilla</i>
White-rumped Sandpiper	<i>Calidris fuscicollis</i>
Pectoral Sandpiper	<i>Calidris melanotos</i>
Dunlin	<i>Calidris alpina</i>
Stilt Sandpiper	<i>Calidris himantopus</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Common Snipe	<i>Gallinago gallinago</i>
American Woodcock	<i>Scolopax minor</i>
Laughing Gull	<i>Larus atricilla</i>
Franklin's Gull	<i>Larus pipixcan</i>
Bonaparte's Gull	<i>Larus Philadelphia</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Herring Gull	<i>Larus argentatus</i>
Gull-billed Tern	<i>Sterna nilotica</i>
Caspian Tern	<i>Sterna caspia</i>
Royal Tern	<i>Sterna maxima</i>
Common Tern	<i>Sterna hirundo</i>
Forster's Tern	<i>Sterna forsteri</i>
Least Tern	<i>Sterna antillarum</i>
Black Tern	<i>Childonias niger</i>
Black Skimmer	<i>Rynchops niger</i>
Pigeons and Doves	
Mourning Dove	<i>Zenaida macroura</i>
White-winged Dove	<i>Zenaida asiatica</i>
Cuckoos	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Groove-billed Ani	<i>Crotophaga sulcirostris</i>
Owls	
Barn Owl	<i>Tyto alba</i>
Eastern Screech Owl	<i>Megascops asio</i>
Great Horned Owl	<i>Bubo virginianus</i>
Burrowing Owl	<i>Athene cunicularia</i>
Short-eared Owl	<i>Asio flammeus</i>
Nightjars	
Common Nighthawk	<i>Chordeiles minor</i>
Chuck-will's widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferous</i>
Swifts and Hummingbirds	
Chimney Swift	<i>Chaetura pelagica</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
Kingfishers	
Belted Kingfisher	<i>Megaceryle alcyon</i>
Woodpeckers	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Northern Flicker	<i>Colaptes auratus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Flycatchers	
Olive-sided Flycatcher	<i>Contopus cooperi</i>

Eastern Wood-Pewee	<i>Contopus virens</i>
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>
Acadian Flycatcher	<i>Empidonax virescens</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>
Martins and Swallows	
Purple Martin	<i>Progne subis</i>
Tree Swallow	<i>Iridoprocne bicolor</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Bank Swallow	<i>Riparia riparia</i>
Barn Swallow	<i>Hirundo rustica</i>
Jays and Crows	
Blue Jay	<i>Cyanocitta cristata</i>
Fish Crow	<i>Corvus ossifragus</i>
Nuthatchers	
Red-breasted Nuthatch	<i>Sitta Canadensis</i>
Creepers	
Brown Creeper	<i>Certhia americana</i>
Wrens	
Carolina Wren	<i>Thryothorus ludovicianus</i>
Winter Wren	<i>Troglodytes troglodytes</i>
Sedge Wren	<i>Cistothorus platensis</i>
Marsh Wren	<i>Cistothorus palustris</i>
House Wren	<i>Troglodytes aedon</i>
Carolina Chickadee	<i>Poecile carolinensis</i>
Kinglets and Gnatcatchers	
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Blue-gray Gnatcatcher	<i>Poliioptila caerulea</i>
Bluebirds, Thrushes and Robins	
Eastern Bluebird	<i>Sialia sialis</i>
Veery	<i>Catharus fuscescens</i>
Gray-cheeked Thrush	<i>Catharus minimus</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Hermit Thrush	<i>Catharus guttatus</i>
Wood Thrush	<i>Hylocichla mustelina</i>
American Robin	<i>Turdus migratorius</i>
Thrashers	
Gray Catbird	<i>Dumetella carolinensis</i>
Brown Thrasher	<i>Toxostoma rufum</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Pipits	
American Pipit	<i>Anthus rubescens</i>
Waxwings	
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Starling	
European Starling	<i>Sturnus vulgaris</i>
Shrike	
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Vireos	
White-eyed Vireo	<i>Vireo griseus</i>

Blue-headed Vireo	<i>Vireo solitarius</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>
Warbling Vireo	<i>Vireo gilvus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Philadelphia Vireo	<i>Vireo philadelphicus</i>
Warblers	
Blue-winged Warbler	<i>Vermivora pinus</i>
Golden-winged Warbler	<i>Vermivora chrysoptera</i>
Tennessee Warbler	<i>Vermivora peregrine</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
Nashville Warbler	<i>Vermivora ruficapilla</i>
Yellow Warbler	<i>Dendroica petechia</i>
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Magnolia Warbler	<i>Dendroica magnolia</i>
Cape May Warbler	<i>Dendroica tigrina</i>
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Yellow-rumped Warbler	<i>Dendroica coronata</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Blackburnian Warbler	<i>Dendroica fusca</i>
Yellow-throated Warbler	<i>Dendroica dominica</i>
Prairie Warbler	<i>Dendroica discolor</i>
Palm Warbler	<i>Dendroica palmarum</i>
Bay-breasted Warbler	<i>Dendroica castanea</i>
Blackpole Warbler	<i>Dendroica striata</i>
Cerulean Warbler	<i>Dendroica cerulea</i>
Black-and-white Warbler	<i>Mniotilta varia</i>
American Redstart	<i>Setophaga ruticilla</i>
Prothonotary Warbler	<i>Protonotaria citrea</i>
Worm-eating Warbler	<i>Helmitheros vermivorus</i>
Ovenbird	<i>Seiurus aurocapilla</i>
Northern Waterthrush	<i>Seiurus noveboracensis</i>
Louisiana Waterthrush	<i>Seiurus motacilla</i>
Kentucky Warbler	<i>Oporornis formosus</i>
Mourning Warbler	<i>Oporornis philadelphia</i>
Hooded Warbler	<i>Wilsonia citrina</i>
Canada Warbler	<i>Wilsonia Canadensis</i>
Yellow-breasted Chat	<i>Icteria virens</i>
Northern Parula	<i>Parula americana</i>
Common Yellowthroat	<i>Geothlypos trichas</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Tanagers	
Summer Tanager	<i>Piranga rubra</i>
Scarlet Tanager	<i>Piranga olivacea</i>
Western Tanager	<i>Piranga ludoviciana</i>
New World Finches	
Northern Cardinal	<i>Cardinalis cardinalis</i>
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Blue Grosbeak	<i>Passerina caerulea</i>
Indigo Bunting	<i>Passerina cyanea</i>
Painted Bunting	<i>Passerina ciris</i>
Dickcissel	<i>Spiza americana</i>
Sparrows	
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
Field Sparrow	<i>Spizella pusilla</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Lark Sparrow	<i>Chondestes grammacus</i>

Savannah Sparrow	<i>Passerculus sandwichensis</i>
LeConte's Sparrow	<i>Ammodramus leconteii</i>
Saltmarsh Sharp-tailed Sparrow	<i>Ammodramus caudacutus</i>
Fox Sparrow	<i>Passerella iliaca</i>
Song Sparrow	<i>Melospiza melodia</i>
Lincoln's Sparrow	<i>Melospiza lincolni</i>
Swamp Sparrow	<i>Melospiza Georgiana</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Chipping Sparrow	<i>Spizella passerine</i>
Blackbirds, Grackles, Cowbirds and Orioles	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
Rusty Blackbird	<i>Euphagus carolinus</i>
Boat-tailed Grackle	<i>Quiscalus major</i>
Common Grackle	<i>Quiscalus quiscula</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Orchard Oriole	<i>Icterus spurius</i>
Altamira Oriole	<i>Icterus galulris</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Great-tailed Grackle	<i>Quiscalus mexicanus</i>
Old World Finches	
Purple Finch	<i>Carpodacus purpureus</i>
American Goldfinch	<i>Carduelis tristis</i>
Weaver Finches	
House Sparrow	<i>Passer domesticus</i>
Mammals	
Marsupials	
Virginia Opossum	<i>Didelphis marsupialis</i>
Edentates	
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Insectivores	
Least Shrew	<i>Cryptotis parva</i>
Bats	
Red Bat	<i>Lasiurus borealis</i>
Seminole Bat	<i>Lasiurus seminolus</i>
Yellow Bat	<i>Lasiurus ega</i>
Carnivores	
Coyote	<i>Canis latrans</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Red Fox	<i>Vulpes vulpes</i>
Raccoon	<i>Procyon lotor</i>
Mink	<i>Mustela vison</i>
Striped Skunk	<i>Mephitis mephitis</i>
River Otter	<i>Lutra canadensis</i>
Bobcat	<i>Lynx rufus</i>
Ungulates	
White-tailed Deer	<i>Odocoileus virginianus</i>
Rodents	
Marsh Rice Rat	<i>Oryzomys palustris</i>
Fulvous Harvest Mouse	<i>Reithrodontomys fulvescens</i>
Hispid Cotton Rat	<i>Sigmodon hispidus</i>

Muskrat	<i>Ondatra zibethicus</i>
House Mouse	<i>Mus musculus</i>
Black Rat	<i>Rattus rattus</i>
Norway Rat	<i>Rattus norvegicus</i>
Nutria	<i>Myocastor coypus</i>
Fox Squirrel	<i>Sciurus niger</i>
Lagomorphs	
Swamp Rabbit	<i>Sylvilagus aquaticus</i>
Eastern Cottontail	<i>Sylvilagus floridanus</i>
Reptiles and Amphibians	
Alligator	
American Alligator	<i>Alligator mississippiensis</i>
Lizards	
Green Anole	<i>Anolis carolinensis</i>
Ground Skink	<i>Scinella lateralis</i>
Five-lined Skink	<i>Eumeces fasciatus</i>
Broadhead Skink	<i>Eumeces laticeps</i>
Turtles	
Snapping Turtle	<i>Chelydra serpentina</i>
Alligator Snapping Turtle	<i>Macrolemys temminckii</i>
Painted Turtle	<i>Chrysemys picta</i>
Mississippi Map Turtle	<i>Graptemys kohnii</i>
Slider	<i>Trachemys scripta</i>
Chicken Turtle	<i>Deirochelys reticularia</i>
Eastern Box Turtle	<i>Terrapene carolina</i>
Stinkpot Turtle	<i>Sternotherus odoratus</i>
Eastern Mud Turtle	<i>Kinosternon subrubrum</i>
Spiny Softshell	<i>Apalone spinifera</i>
River Cooter	<i>Pseudemys concinna</i>
Snakes	
Southern Water Snake	<i>Nerodia fasciata</i>
Western Green Water Snake	<i>Nerodia cyclopion</i>
Plain-bellied Water Snake	<i>Nerodia erythrogaster</i>
Diamondback Water Snake	<i>Nerodia rhombifer</i>
Brown Snake	<i>Storeria dekayi</i>
Western Ribbon Snake	<i>Thamnophis proximus</i>
Glossy Crayfish Snake	<i>Regina rigida</i>
Graham's Crayfish Snake	<i>Regina grahamii</i>
Mud Snake	<i>Farancia abacura</i>
Rat Snake	<i>Elaphe obsoleta</i>
Common Kingsnake	<i>Lampropeltis getulus</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Rough Green Snake	<i>Opheodrys aestivus</i>
Salamanders	
Three-toed Amphiuma	<i>Amphiuma tridactylum</i>
Western lesser Siren	<i>Siren intermedia</i>
Central Newt	<i>Notophthalmus viridescens louisianensis</i>
Frogs and Toads	
Gulf Coast Toad	<i>Bufo valliceps</i>
Northern Cricket Frog	<i>Acris crepitans</i>
Green Treefrog	<i>Hyla cinera</i>
Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>
Bullfrog	<i>Rana catesbeiana</i>
Pig Frog	<i>Rana grylio</i>
Southern Leopard Frog	<i>Rana utricularia</i>

Squirrel Tree Frog *Hyla squirella*
Bronze Frog *Rana clamitans*
Gray/Cope's Treefrog *Hyla versicolor/chrysoscells*

Fish

Gars

Spotted Gar *Lepisosteus oculatus*
Longnose Gar *Lepisosteus osseus*
Alligator Gar *Lepisosteus spatula*

Bowfins

Bowfin *Amia calva*

Herrings

Gizzard Shad *Dorosoma cepedianum*
Threadfin Shad *Dorosoma petenense*

Lizardfishes

Inshore Lizardfish *Synodus foetens*

Carps

Common Carp *Cyprinus carpio*
Golden Shiner *Notemigonus crysoleucas*

Suckers

Smallmouth Buffalo *Ictiobus bubalus*
Bigmouth Buffalo *Ictiobus cyprinellus*

Freshwater Catfishes

Blue Catfish *Ictalurus furcatus*
Black Bullhead *Ameiurus melas*
Yellow Bullhead *Ameiurus natalis*
Channel Catfish *Ictalurus punctatus*

Sunfishes

Flier *Centrarchus macropterus*
Banded Pygmy Sunfish *Elassoma zonatum*
Warmouth *Lepomis gulosus*
Bluegill *Lepomis macrochirus*
Redear Sunfish *Lepomis microlophus*
Bantam Sunfish *Lepomis symmetricus*
Green Sunfish *Lepomis cyanellus*
Longear Sunfish *Lepomis megalotis*
Largemouth Bass *Micropterus salmoides*
White Crappie *Pomoxis annularis*
Black Crappie *Pomoxis nigromaculatus*

Drums

Freshwater Drum *Aplodinotus grunniens*
Spot *Leiostomus xanthurus*

Mullet

Striped Mullet *Mugil cephalus*
White Mullet *Mugil curema*

Pike

Chain Pickerel *Esox niger*

Temperate Bass

Yellow Bass *Monore mississippiensis*

Invertebrates

Crustaceans

White River Crayfish *Procambarus acutus*
Red Swamp Crayfish *Procambarus clarkii*

Isopods and Amphipods

Wood-boring Isopod *Sphaeroma terebrans*

Rock Louse
Fish Louse
Wharf Roach
Beach Flea
Marsh Hopper

Ligia occidentalis
Argulus spp.
Ligia spp.
Orchestia grillus
Talorchestia spp.

Plants

Alligator Weed
American Lotus
Baccharis
Baldcypress
Banana Water Lily
Barnyard Grass
Black Needlerush
Black Willow
Beggars' Tick
Bird's Eye Bush
Blue Water Lily
Brazilian Verbena
Brownseed Paspalum
Bulltongue
Bullwhip
Bushy Bluestem
Buttonbush
Cattail
Chinese Tallow
Chocolate Weed
Coastal Water-Hyssop
Coffeeweed
Common Bladderwort
Coontail
Curly-leaf Dock
Duckweed
Dog Fennel
Dwarf Spikerush
Eurasian Watermilfoil
Fall Panicum
False Garlic
Fanwort
Flatsedges
Floating Water Primrose
Frogbit
Frogfruit
Giant Cutgrass
Giant Ragweed
Grasslike Fimbr
Horned Beakrush
Hydrilla
Iris
Jungle Rice
Maidencane
Marshhay Cordgrass
Mosquito-Fern
Muskgrass
Parrot Feather
Pennywort

Alternanthera philoxeroides
Nelumbo lutea
Baccharis halimifolia
Taxodium distichum
Nymphaea mexicana
Echinochloa crusgalli
Juncus roemerianus
Salix nigra
Bidens laevis
Ochna serrulata
Nymphaea elegans
Verbena brasiliensis
Paspalum plicatulum
Sagittaria lancifolia
Scirpus californicus
Andropogon glomeratus
Cephalanthus occidentalis
Typa spp
Sapium sebiferum
Melochia corchorifolia
Bacopa monnieri
Sesbania macrocarpa
Utricularia vulgaris
Ceratophyllum demersum
Rumex crispus
Lemna minor
Eupatorium capillifolium
Eleocharis parvula
Myriophyllum spicatum
Panicum dichotomiflorum
Nothoscordum bivalve
Cabomba caroliniana
Cyperus spp.
Ludwigia peploides
Limnobium spongia
Phyla nodiflora
Zizaniopsis miliacea
Ambrosia trifida
Fimbristylis miliacea
Rhynchospora corniculata
Hydrilla verticillata
Iris virginica
Echinochloa colonum
Panicum hemitomon
Spartina patens
Azolla caroliniana
Chara spp.
Myriophyllum aquaticum
Hydrocotyle spp

Pickerelweed	<i>Pontederia cordata</i>
Rattlebox	<i>Sesbania drummondii</i>
Red Rice	<i>Oryza functata</i>
Roseau cane	<i>Phragmites australis</i>
Sago Pondweed	<i>Potamogeton pectinatus</i>
Saltmarsh Mallow	<i>Kosteletzkya virginica</i>
Saltmarsh Morning Glory	<i>Ipomoea sagittata</i>
Sawgrass	<i>Cladium jamaicense</i>
Seashore Paspalum	<i>Paspalum vaginatum</i>
Smartweed	<i>Polygonum spp.</i>
Softstem Bullrush	<i>Scirpus validus</i>
Southern Naiad	<i>Najas quadalupensis</i>
Southern Swamp Lily	<i>Crinum americanum</i>
Spatterdock	<i>Nuphar luteum</i>
Spikerushes	<i>Eleocharis spp.</i>
Sprangletop	<i>Leptochloa fascicularis</i>
Squarestem Spikerush	<i>Eleocharis quadrangulata</i>
Sumpweed	<i>Iva annua</i>
Thalia	<i>Thalia dealbata</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Three-cornered Grass	<i>Scirpus olneyi</i>
Toothache Tree	<i>Zanthoxylum calva-herculis</i>
Vasey Grass	<i>Paspalum urvillei</i>
Walter's Millet	<i>Echinochloa walteri</i>
Water Hyacinth	<i>Eichornia crassipes</i>
Water Lettuce	<i>Pistia stratiotes</i>
Water Pepper	<i>Polygonum hydropiperoides</i>
Water Shield	<i>Brasenia schreberi</i>
Wax-Myrtle	<i>Myrica cerifera</i>
White-topped Sedge	<i>Rhynchospora colorata</i>
White Water Lily	<i>Nymphaea odorata</i>
Wigeongrass	<i>Ruppia maritima</i>

Appendix E - Scoping

A series of scoping meetings and focus groups were held to obtain input from the general public on the comprehensive conservation plans for each refuge in the Southwest Louisiana National Wildlife Refuge Complex, including Lacassine. Meetings were held in various communities in Cameron Parish in 2002 as follows: October 1, Carlyss; October 8, Grand Lake; October 10, Cameron; October 16, Hackberry; and October 17, Johnson Bayou.

Approximately 25 people in total attended these meetings. On January 16, and February 4, 2003, public open house meetings were held in Lake Charles with a total of 33 people attending. Comment forms were placed in the Refuge Visitor Center and invitations to comment or provide input were issued at various special events. Various issues emerged from these meetings and were considered during the preparation of the plan.

An intensive effort to bring together people who were interested in fishing issues at the refuge resulted in over 40 members of the public attending a Fishing Focus Group meeting in Lake Charles on September 4, 2003. Participants were given an overview of the refuge and the planning process and then randomly assigned to smaller groups to discuss issues. Each group brainstormed, and identified and prioritized issues, and a representative of each group presented its results to the entire audience. The format of the meeting facilitated open discussion among user groups with conflicting interests and among the public and Service staff.

Over 50 people attended a meeting on May 18, 2005, at the Lake Charles Civic Center to discuss future management of the Lacassine Pool. Continued interest in the pool and associated issues with fishing prompted the Service to hold the meeting. Various management alternatives were presented and participants were invited to review and select their preferred solution. The majority of the participants chose the Service's proposed action plan, which makes up the draft plan.

News releases were sent to local media to inform the public about opportunities to comment and are shown below. Meetings scheduled for October 4, 5, and 6, 2002, were cancelled by notifying the media by telephone due to local communities evacuating during the landfall of Hurricane Lily. Meetings were rescheduled (see News Release #2). A worksheet, comment form, and brochure were also available and are shown below.

News Release # 1

9/23/02

**Southwest Louisiana Refuge Complex Hosts Open House
Public Invited to Help Develop Management Plan**

The U.S. Fish and Wildlife Service will hold six public open house sessions for the Southwest Louisiana Refuge Complex in early October to gather input to help prepare a new comprehensive conservation management plan (CCP). The Refuge Complex is comprised of Sabine and Cameron Prairie National Wildlife Refuges which are two of more than 500 refuges nationwide within the National Wildlife Refuge System. The System is dedicated entirely to the conservation of wildlife and their habitats.

The public is invited to the open houses to be held at various locations: **October 1, Carlyss Lions Club; October 3, Community Center, Hackberry; October 4, Community Center, Johnson Bayou; October 5, Civic Center, Lake Charles; October 8, Fireman Center, Grand Lake; and October 9, Police Jury Annex, Cameron.** Hours for all meetings with the exception of Lake Charles will be from 1:00 - 8:00 pm; Lake Charles's meeting will be from 9:00 am - 4:00 pm. (See Table at end of article). Those attending may come at any time during the open house to view maps and other displays, consider refuge purpose and mission statements, visit one-on-one with Service representatives, and give their personal suggestions for future management of the refuge. The input received will be used to evaluate the refuge's effectiveness toward meeting its obligations to the public and the Nation's natural resources, and to plan for future refuge programs and operations. Comments may also be made at the two Refuge Visitor Centers, by email, fax, or through the mail. According to Project Leader Chris Pease, "we need the public's input and the best way to use it is to receive it in writing."

The Service is updating management plans for all lands in the National Wildlife Refuge System. The planning effort is part of the Fish and Wildlife Improvement Act of 1997 which requires national wildlife refuges to reassess their capabilities to protect fish, wildlife, and plant resources and their habitats while also providing compatible wildlife-dependent public uses. The Refuge Complex is in the initial stages of preparing its comprehensive conservation plan that will guide refuge activities and operations for the next 15 years. The new plan will likely include most of the current refuge programs, but unlike previous plans, there will be extensive effort to obtain ideas and concerns from the public, refuge users, neighbors, and partner agencies. Other opportunities for open house meetings for Lacassine National Wildlife Refuge and the other two refuges will be announced at a later date.

Sabine National Wildlife Refuge in Cameron Parish was established in 1937 by Executive Order for the protection of wintering waterfowl. The Refuge protects vast areas of coastal marshland which help support significant wildlife and fisheries resources. These resources are important to SW Louisiana - both biologically and economically. Cameron Prairie National Wildlife Refuge, also located in Cameron Parish, was established to provide for nesting, migrating, and wintering birds and their critical habitat. It was the first refuge established under the North American Waterfowl Management Plan in 1988 with funding provided by the sale of Duck Stamps. The refuge's marshes annually attract a diverse array of migratory birds and other wildlife. After the open house meetings, a draft plan will be written and presented to the public. During the CCP process, a planning team will develop goals, objectives, and strategies to define management actions. The team will develop a reasonable range of alternatives to determine a proposed management action. All alternatives will be reviewed to assess the environmental effects of each one. During the public's review, comments may

be made regarding the Service's preferred alternative. After considering comments, the Service will amend the plan if necessary and then will prepare and adopt a final plan.

For further information regarding the meetings, contact Natural Resource Planner Judy McClendon at Southwest Louisiana Refuges Complex, 1428 SH 27, Bell City, LA 70630. Phone: 337-598-2216, Fax: 337-598-2492, or email judy_mcclendon@fws.gov

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 500 national wildlife refuges, thousands of small wetlands, and other special management areas. It also operates 66 national fish hatcheries, 64 fish and wildlife management assistance offices and 78 ecological services field stations.

U.S. Fish and Wildlife Service Public Scoping
Meetings Schedule
(For information the day of meetings, call
337-526-3667)

Thursday, October 3 **Tuesday, October 8**

Hackberry Community Center 986 Main Street Hackberry 1:00 pm to 8:00 pm	Fireman Center 957A Hwy 384 Grand Lake 1:00 pm - 8:00 pm
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Friday, October 4 **Thursday, October 10**

Recreation Center Hwy 82 Johnson Bayou 1:00 pm to 8:00 pm	Police Jury Annex 110 Smith Circle Cameron 1:00 pm - 8:00 pm
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Saturday, October 5

Civic Center
900 Lakeshore Drive
Lake Charles
9:00 am - 4:00 pm

U.S. Fish and Wildlife Service
Southwest Louisiana Refuges
Contact Information

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News Release #2

Electronically mailed to all media on October 7, 2002.

Due to all the Hurricane Hoopla, we would like to remind the public about their opportunities to make comments/suggestions regarding their local National Wildlife Refuges at this week's open house meetings. Thank You for your assistance.

**NEWS RELEASE
SW LA REFUGE COMPLEX**

Cameron Prairie NWR
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Sabine NWR
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Hackberry LA 70645
Phone: 337-762-3816
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For Immediate Release 10/07/2002
Contact: Diane Borden-Billiot, 337-762-3816

**Southwest Louisiana Refuge Complex Open House Reminder
Public Invited to Help Develop Management Plan**

The U.S. Fish and Wildlife Service will be holding two public open house sessions for the Southwest Louisiana Refuge Complex this week to gather input to help prepare a new comprehensive conservation management plan (CCP). The Refuge Complex is comprised of Sabine and Cameron Prairie National Wildlife Refuges which are two of more than 500 refuges nationwide within the National Wildlife Refuge System. The System is dedicated entirely to the conservation of wildlife and their habitats.

The public is invited to the open houses to be held : **October 8, Fireman Center, Grand Lake; and October 9, Police Jury Annex, Cameron.** Hours for the meetings will be from 1:00 - 8:00 pm. Those attending may come at any time during the open house to view maps and other displays, consider refuge purpose and mission statements, visit one-on-one with Service representatives, and give their personal suggestions for future management of the refuge. The input received will be used to evaluate the refuge's effectiveness toward meeting its obligations to the public and the Nation's natural resources, and to plan for future refuge programs and operations. Comments may also be made at the two Refuge Visitor Centers, by email, fax, or through the mail. According to Project Leader Chris Pease, "we need the public's input and the best way to use it is to receive it in writing."

The Service is updating management plans for all lands in the National Wildlife Refuge System. The planning effort is part of the Fish and Wildlife Improvement Act of 1997 which requires national wildlife refuges to reassess their capabilities to protect fish, wildlife, and plant resources and their habitats while also providing compatible wildlife-dependent public uses. The Refuge Complex is in the initial stages of preparing its comprehensive conservation plan that will guide refuge activities and operations for the next 15 years. The new plan will likely include most of the current refuge programs, but unlike previous plans, there will be extensive effort to obtain ideas and concerns from the public, refuge users, neighbors, and partner agencies. Open house meeting opportunities for Lacassine NWR in Lake Arthur, LA will be announced at a later date.

Sabine National Wildlife Refuge in Cameron Parish was established in 1937 by Executive Order for the protection of wintering waterfowl. The Refuge protects vast areas of coastal marshland which help support significant wildlife and fisheries resources. These resources are important to SW Louisiana - both biologically and economically. *Cameron Prairie National Wildlife Refuge*, also located in Cameron Parish, was established to provide for nesting, migrating, and wintering birds and their critical habitat. It was the first refuge established under the North American Waterfowl Management Plan in 1988 with funding provided by the sale of Duck Stamps. The refuge's marshes annually attract a diverse array of migratory birds and other wildlife.

After the open house meetings, a draft plan will be written and presented to the public. During the CCP process, a planning team will develop goals, objectives, and strategies to define management actions. The team will develop a reasonable range of alternatives to determine a proposed management action. All alternatives will be reviewed to assess the environmental effects of each one. During the public's review, comments may be made regarding the Service's preferred alternative. After considering comments, the Service will amend the plan if necessary and then will prepare and adopt a final plan.

For further information regarding the meetings, contact Natural Resource Planner Judy McClendon at Southwest Louisiana Refuges Complex, 1428 SH 27, Bell City, LA 70630. Phone: 337-598-2216, Fax: 337-598-2492, or email judy_mcclendon@fws.gov

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 500 national wildlife refuges, thousands of small wetlands, and other special management areas. It also operates 66 national fish hatcheries, 64 fish and wildlife management assistance offices and 78 ecological services field stations.

News Release #3

Issued to media via e-mail on January 7, 2003

National Wildlife Refuges in southwest Louisiana managed by the U.S. Fish and Wildlife Service are participating in a Comprehensive Conservation Plan (CCP) process and invites the public to participate. The CCP is developed with partners such as state wildlife agencies, elected officials, non-governmental conservation agencies, and interested public.

Refuges in Cameron Parish undergoing the process include Sabine, Cameron Prairie, and Lacassine National Wildlife Refuges. These Refuges are three of more than 535 nationwide within the National Wildlife Refuge System which is dedicated entirely to the conservation of wildlife and their habitats.

One of the first steps in the CCP process is to solicit public input regarding management of the refuges. An open house meeting will be held on January 16, 2003, at the Best Suites Inn, 401 Lakeshore Drive, in Lake Charles to give people an opportunity to discuss or comment on management issues. The public may drop by anytime between 2:00 pm and 7:00 pm to view displays, pick up information, or talk with Refuge personnel. Formal presentations will be given at 2:30, 4:30, and 6:30 p.m. A question and answer session will follow each formal presentation.

In 1997, Congress passed the National Wildlife Refuge System Improvement Act which set the stage for ensuring that wildlife refuges continue to be managed for the benefit of both wildlife and the American people. The Act articulates a clear conservation mission for fish, wildlife, and plant conservation and also mandates CCP's be prepared for every national wildlife refuge.

The plans will specify management direction for the refuges for the next 15 years while ensuring that each refuge's uses are compatible with its mission and purpose for being established. The CCP process will encourage greater involvement by partners and neighbors in wildlife refuge management decision-making and public use programs. Anyone who is interested in the future of the Refuges is invited to participate.

For further information on the meeting, please call Natural Resource Planner Judy McClendon at 337-598-2216 or 337-526-3667.

Public Scoping Meetings:

Thursday, October 3	Tuesday, October 8
Hackberry Community Center 986 Main Street Hackberry 1:00 pm to 8:00 pm	Fireman Center 957A Hwy 384 Grand Lake 1:00 pm - 8:00 pm
Friday, October 4	Thurs., October 10
Recreation Center Hwy 82 Johnson Bayou 1:00 pm to 8:00 pm	Police Jury Annex 110 Smith Circle Cameron 1:00 pm - 8:00 pm
Saturday, October 5	
Civic Center 900 Lakeshore Drive Lake Charles 9:00 am - 4:00 pm	

For information the day of meetings, call 337-526-3667.

Sabine National Wildlife Refuge

Sabine National Wildlife Refuge, in Cameron Parish was established in 1937 for the protection of wintering waterfowl. The Refuge protects vast areas of coastal marshland which help support significant wildlife and fisheries resources. These resources are important to SW Louisiana - both biologically and economically.

Executive Order 7764, dated Dec. 6, 1937, states the official purpose of the refuge is, "... as a refuge and breeding ground for migratory birds and other wildlife." A secondary purpose of the refuge is "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds. 16 U.S.C. 715d - Migratory Bird Conservation Act.

Sabine is the largest Service refuge in Louisiana with 124,511 acres; 84,667 acres of grassland/herbaceous marsh and 39,844 acres of open water.

Sabine is managed with goals, objectives, and strategies designed to restore habitat, manage water levels, conduct surveys, censuses, investigations, and

studies. Some tools used to accomplish goals and objectives include prescribed burning, mowing, haying, and grazing.

Public use opportunities include fishing, crabbing, shrimping, hunting, nature trails, environmental education, and wildlife observation and photography.

Cameron Prairie National Wildlife Refuge

Cameron Prairie National Wildlife Refuge is located approximately 25 miles southeast of Lake Charles, in Cameron Parish. It was established to provide for nesting, migrating, and wintering birds and their critical habitat. It was the first refuge established under the North American Waterfowl Management Plan. The Refuge was purchased on December 29, 1988 with \$3.1 million dollars provided by the Migratory Bird Stamp Act (Duck Stamp Fund).

The primary purpose of establishment of this refuge was "... 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 refuge contains 9,621 acres that include fresh marsh, coastal prairie, and old rice fields (currently moist soil units). It provides excellent habitat for migratory waterfowl, shorebirds, and neotropical migrants, as well as habitat for local species such as white-tailed deer, small game, furbearers, American alligators, and other wildlife species.

Cameron Prairie National Wildlife Refuge is managed to provide natural foods for wintering waterfowl and other water birds. This is done by using moist soil management techniques to grow natural plants and by constructing levees and water control structures to provide water for wildfowl usage.

The refuge lends itself to high quality public use activities such as wildlife observation, bird watching, and photography. Additional recreational activities on the refuge include an archery white-tailed deer hunt, waterfowl youth-only hunt, rabbit hunt, snipe hunt, dove hunt, fresh water fishing, and an auto tour route.

Southwest Louisiana Refuges Complex

Comprehensive Conservation Planning



Who are we:

The Southwest Louisiana Refuges Complex is comprised of Sabine and Cameron Prairie National Wildlife Refuges, both managed by the U.S. Fish and Wildlife Service. These Refuges are two of more than 535 nationwide within the National Wildlife Refuge System which is dedicated entirely to the conservation of wildlife and their habitats.

What are we doing:

The Complex is beginning a planning process which will result in a **Comprehensive Conservation Plan (CCP)** to specify management direction for the refuges for the next 15 years

The plan must ensure that each refuge's uses are compatible with its mission and purpose for being established. It will encourage greater involvement by partners and neighbors in wildlife refuge management decision-making and public use programs.

Refuges are managed based on biology with the underlying theme that wildlife and their habitats come first.

Wildlife-dependent public uses are allowed if compatible with the purpose of the Refuge. If conflict occurs, it shall be resolved so that management still protects the original purpose of the Refuge.

Refuge System Mission:
"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."

Under the CCP process we will consider how the refuges contribute to the overall Refuge System mission and still accomplish the original purpose for refuge establishment.

Why are we doing this:

In 1997, Congress passed the National Wildlife Refuge System Improvement Act which set the stage for ensuring that wildlife refuges continue to be managed for the benefit of both wildlife and the American people.

Two important components of the Act which articulates a clear conservation mission for fish, wildlife, and plant conservation are:

- 1) Designated priority wildlife-dependent public uses as hunting and fishing; wildlife observation and photography; and interpretation and environmental education when they are compatible with the refuge's purpose and the mission of the System
- 2) Mandated comprehensive conservation plans (CCP) for every national wildlife refuge which are for a 15-year period and must be completed by 2012.

How will we conduct the process:

During the CCP process, a planning team will develop goals, objectives, and strategies to define management actions. The team will develop a reasonable range of alternatives to determine a proposed management action. All alternatives will be reviewed to assess the environmental effects of each one.

One of the first steps in the process is to solicit public input regarding management of the refuges. After notifying the public about opportunities to comment, we will hold scoping meetings to receive the comments. We will discuss and scope issues with participants. Scoping is defined as a process to determine

what the significant issues will be during the planning process.

Who will help us:

The CCP is developed with our partners such as state wildlife agencies, elected officials, non-governmental conservation agencies, and the general public.

After the scoping meetings, a draft plan will be written and presented to the public. During the public's review, comments may be made regarding the Service's preferred alternative. After considering comments, the Service will amend the plan if necessary and then will prepare and adopt a final plan.

Remember, we need your input and the best way to use it is to receive it in writing.

How to Get Involved:

For further information, contact the following:

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FOCUS GROUP MEETING REPORT – SEPTEMBER 4, 2003

An intensive effort to bring together people who were interested in fishing issues at the Refuge resulted in over 40 members of the public attending a Fishing Focus Group meeting at McNeese State University in Lake Charles on September 4, 2003. Participants were given an overview of the Refuge and the planning process and then randomly assigned to smaller groups to discuss issues. Each group brainstormed, identified and prioritized issues, and a representative of each group presented their results to the entire audience. The format of the meeting facilitated open discussion among user groups with conflicting interests and among the public and Service staff.

Participants were divided into five smaller working groups after general presentations by Judy McClendon, Planner, SW LA Refuges; Leon Kolankiewicz, Project Manager, Mangi Environmental Group; and Bryan Winton, Assistant Manager, Lacassine National Wildlife Refuge. Each group had approximately 90 minutes to brainstorm, discuss, and prioritize issues and then elected a representative to address the entire audience and present the group's issues and proposed recommendations. Many groups had similar issues and recommendations. Listed below are the major issues and themes raised during the evening.

Safety:

1. Make it mandatory to use bicycle flags on boats.
2. A false sense of security may occur if fishermen assume all boat users are using flags and some are not complying.
3. Marking intersections would be better than requiring boat flags.
4. Mark intersections on boat runs/trails.
5. Widen all intersections.
6. Require boats in tournaments to slow down.
7. Keep horsepower at 25 mph.
8. Banks are too steep. Put some wharfs that go out in water for bank fishermen and family fishermen. This would help keep kids out of the roads and parking areas which is dangerous when traffic is heavy.
9. Do not go to 40 horsepower motors in pool.

Law Enforcement:

1. Need to check fishermen more often. Many in room had never been checked.
2. More checks would result in better experiences for all and eliminate problems.
3. Litter is a major problem. No containers available to throw trash in.
4. Ban alcohol from refuge.
5. More visible enforcement.
6. Enforce "NO WAKE ZONES".

Creel/Slot Limits:

1. Enforce a creel limit of 5 fish per person with a slot size of 14-17" length.
2. Enforce a creel limit of 5 fish per person with a slot size of 14" length.
3. Enforce a creel limit of 5 fish per person with a slot size of 16– 21" length; 12" minimum.
4. Allow a creel limit of 5 fish per person with no slot limit.
5. No limit on white perch and chinquapins.
6. Enforce catch and release during spawn only, March – April 15; March 15 – April 30.
7. Due to overcrowding of users on opening and other heavy use days, restrict what can be kept to improve quality.
8. Have a later opening date.
9. Give fisherman more days to fish, open March 1 through October 15.

-
10. Catch and release for one more year.

Water Levels:

1. Pre-determine a drought plan.
2. Have a more aggressive water management plan.
3. Install better boards.
4. Install non-removable boards.
5. Document levels at least once a month.
6. Mark low and high spots in pool.
7. Need better management regarding water levels.
8. Raise water level a foot which would help both ducks and fish.
9. Maintenance is needed on the spillways.
10. Maintenance is needed at the boat launches.
11. Deepen areas inside impoundment.
12. Designate water level recording sites using staff gauges based on GIS study results.

Boat Trails:

1. Widen boat lanes.
2. Deepen boat lanes.
3. Open up the boat lanes.
4. Improve access to pool.
5. Update maps showing boat trails.
6. Control vegetation.
7. Develop incentive program for volunteers to come out and clear trails.

Tournaments:

1. Tournaments are hurting fish populations.
2. Tournaments are more good than bad.
3. Very strongly for tournaments because participants have helped make the pool better, i.e. fish stocking, helped build pavilion/kiosk, help keep the boat trails open, help pick up litter.
4. Not against the premise of tournaments but concerned about safety – tournament fisherman go too fast in boats.
5. Against tournament fishing on the Refuge.
6. Allow tournaments with catch and release only.
7. Encourage weigh-ins on site.
8. Eliminate the \$50 fee since some clubs don't pay anyway.
9. Tournament fishermen need to have better outdoor ethics.
10. Tournament fishermen have good ethics.
11. For tournaments.
12. Allow one trophy fish to be kept.
13. Tournaments help survey fish populations.
14. Tournaments promote fishing and the refuge.
15. Provide advance notice to public (non-tournament anglers) about scheduled tournaments through press releases or an information area at the pool.

Fish Stocking

1. Research the benefits of stocking fry vs. fingerling.
2. Build staging ponds and breeding areas for restocking program.
3. Continue to restock with Florida Bass.

Bank Fishing

1. Control litter problem by providing trash cans.
2. Grassy areas along bank need to be better maintained.

General:

1. Keep pool open 7 days a week.
(Rumor in community that pool would be closed 2 days per week).
2. Control vegetation; it's manager's job to do this but realize there is lack of funding.
3. Charge user fees for all uses if money would be returned to refuge for improved facilities and budget would not subsequently be cut causing a break even situation.
4. Fishermen would like to conduct fundraisers for refuge if money would be spent on improvements.
5. Fishermen would like to organize as a support group for the refuge.
6. Do not charge a fishing fee.

Ongoing concerns by anglers about allegedly dwindling fishing opportunities in the Pool continued to dominate all other management issues on the Refuge. These concerns prompted the Complex to hold a public meeting in Lake Charles on May 18, 2005 to give the public critical background information and provide a chance to select from among a range of potential solutions. The electronically-distributed news release follows:

For Immediate Release

May 4, 2005

Contact: Judy McClendon, Natural Resource Planner, SW Louisiana National Wildlife Refuge Complex
337-598-2216

U.S. Fish and Wildlife Service to Host Meeting on Habitat and Water Management of the Lacassine National Wildlife Refuge Pool

The U.S. Fish and Wildlife Service (Service) and the Louisiana Department of Wildlife and Fisheries (LDWF) will hold a meeting at the Lake Charles Civic Center, Lafitte Room on May 18, 2005, at 12:00 noon to obtain public input about proposed habitat and water management programs on the Lacassine Pool (Pool). The Pool is located on Lacassine National Wildlife Refuge, one of three refuges administered by the Southwest Louisiana National Wildlife Refuge Complex.

The Service is developing a 15-year Comprehensive Conservation Plan (CCP), mandated by law in 1997, to direct management actions on the Refuge. The CCP is developed with involvement by partners and the public. The CCP that evolves from this process will ensure that refuge uses are compatible with Lacassine's mission and purpose for being established. Recently many individuals have identified the Pool as one of their primary concerns.

According to Don Voros, Complex Project Leader, "saving the Pool will be a tremendous challenge as we attempt to remove 60 years of dead vegetation to restore it to a healthy thriving ecosystem that will benefit both migratory birds and fish."

Rainfall is the only source of freshwater used to maintain Pool water level, and there are no tidal influences or flushing actions to aid in dispersing accumulating dead plant material. Without active management, closed systems eventually fill in and the habitat changes. These changes include less open water areas, additional shallow areas and an increase in shrubs and other woody vegetation.

The public is invited to participate in the meeting which will consist of background presentations, small group question and answer sessions with Service and State specialists, and opportunities for the public to review and help identify potential solutions to recover the Pool. Presentations will be given by Complex Project Leader Don Voros, Complex Biologist Dr. Steve Reagan, and LDWF Fisheries Biologist Bobby Reed. Fourteen potential solutions for Pool recovery will be displayed throughout the room and participants may comment on any or all of the solutions.

For information, please call Judy McClendon, Natural Resource Planner, at 337-598-2216.

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FOCUS GROUP MEETING RESULTS – MAY 8, 2005

Complex Project Leader Don Voros opened the meeting, attended by about 125 members of the public, with an overview of the problems Lacassine Pool faces. In recent years, these problems have been impinging on the quality of the sport fishing experience, limiting both access to the fishery and the quality (size) and quantity of fish caught. Mr. Voros began the meeting by showing a PowerPoint slide of a recent scene at the Southwest spillway where critical repair work was underway. A temporary coffer dam had been erected to dewater the site so that work could proceed, a common and necessary engineering/construction technique. Unfortunately, this action was misunderstood by a local reporter and certain members of the public to mean that Refuge staff was lowering the level of water in the Pool as a whole, which of course would have an adverse effect on fish stocks and fishing. A series of subsequent newspaper articles and reports in the broadcast media in the following month discussed and debated Refuge management of Lacassine Pool, and the threats to fish and fishing the Pool confronts.

Mr. Voros then summarized the problem with the following question:

“What can we do over the next 15 years to address over 60 years of accumulated dead plant material in the Lacassine Pool to protect and sustain migratory bird and fisheries habitat?”

He reviewed a succession of studies that as far back as 1953 identified the process of detritus accumulation as one that would limit the life of the Pool. This process would ultimately result in its succession from open water and emergent marsh to scrub-shrub habitat, with the concomitant loss of all wetlands and hence its value to migratory waterfowl and fish. In an effort to address the problem, in 1993 the low part of the south levee was raised, stop logs were added to the spillways, and the water level was raised to 5.0 msl. This expanded the Pool's water volume and increased the water

column in an effort to stress emergent vegetation and prevent or at least slow its encroachment across the Pool. However, success was short-lived: vegetation recovered and organic levels continued to increase.

Fisheries Biologist Bobby Reed of the Louisiana Department of Wildlife and Fisheries (LDWF) then presented highlights of the recent history of the State's management of Lacassine fisheries. He reviewed changes in fishing regulations from 1990 to 2005, provided figures on stocking of largemouth bass and bluegill since 2001, and discussed sampling and data gathering techniques like electrofishing. He concluded that the major factors limiting fisheries production in the Pool are water quality and depth, loss of habitat, poor quality spawning substrates, reduced forage availability and foraging efficiency and Largemouth Bass Virus (LMBV).

Mr. Reed stated LDWF's recommendations for 2005, which included a regular opening and season length (March 15 to October 15), 10 bass per day limit with no minimum length, harvest open to all species of pan fish (there is an excellent year class of black crappie), stock largemouth bass and bluegill fingerlings, educate fishermen concerning LMBV by asking them to avoid holding and culling fish in live wells, continuing to monitor the Pool for the spread of invasive aquatic plant species, and supporting Service efforts to control excessive emergent plant growth and accumulated organic muck in the Pool. Mr. Reed finished up by promoting the use of drawdowns as a management tool, noting that LDWF manages about 60 reservoirs with drawdown capacity. Drawdowns are carried out on about 10-12 of these water bodies annually; drying out the organic substrates oxidizes and compacts organic matter and controls undesirable aquatic growth.

Complex Biologist Dr. Steve Reagan began by reviewing the National Wildlife Refuge System's Organic Act, the National Wildlife Refuge System Improvement Act of 1997, and its bearing on the fishing question in Lacassine Pool. When the Refuge was established in 1937 the area contained only natural marsh; all impoundments including the Pool were established later. He then showed the audience a schematic of the three spillways that release water from the Pool, going on to explain how stoplogs in the spillways hold water in the Pool and describe recent repair efforts at the southwest spillway.

Dr. Reagan showed a slide graphically depicting seasonal and annual variations in historic water levels for selected years from 1942 to 2004. He also explained to the assembly the relationship between these water levels and the loss of open water surface area and water volume in the Pool. In sum, ecological changes in the Pool over the past decades have led to decreasing habitat quality and quantity for both fish and waterfowl, as well as greater difficulty in accessing the Pool for management and recreational fishing purposes. The target of Refuge and Complex management is a 50/50 ration of open water to emergent marsh.

Complex Project Leader Voros then asked the attendees for their input on potential solutions to the Pool's problems and on possible feasibility studies. Complex staff had developed a list of nine proposals and two possible feasibility studies based on discussions with and suggestions by stakeholders and experts. The nine proposals were described in handouts and on posters affixed to the walls of the meeting room. Each proposal was described in writing and shown in a diagram; likely pros and cons of each were also listed on the handouts and the wall posters. Mr. Voros also invited the public to submit their own proposals to the Complex planner by June 1, 2005. The nine proposals were:

Take no action – continue to manage the Pool level at full pool or higher and hope for the best.

Rebuild the entire dike system to accommodate the highest water level possible (wait for natural events to draw down the Pool).

Manage the Pool at full pool (wait for natural events to draw down the Pool) and carry out certain other actions (e.g. repair all spillways and levees; use prescribed fire during droughts; build fish passage ways to deeper water and maintain a deep water interior perimeter ditch around the entire Pool).

Attempt to manage the Pool level far above full pool (1 foot above full pool or higher) and wait for natural events to draw down the Pool).

Experiment with managing the Pool between full pool level and 6 inches above full pool from February to October to see if the levees can withstand the pressure (conduct managed draw-down).

Continue to manage the Pool level at full pool (conduct managed drawdowns).

Subdivide the Pool into 2 interconnected units (5,000 acres and 11,000 acres).

Subdivide the Pool into 3 interconnected units approximately 5,000 acres in size. Treat each unit of a 7 to 10 year cycle.

Subdivide the Pool into 6 interconnected units of varying size (1990 Proposal).

Mr. Voros then reminded everyone of the three sticky, orange dots they had previously been given upon entering the room. He asked them to vote for their three favorite proposals by placing one dot each on three of the nine shown on the wall posters. The results of this voting are as follows, ranked in order of the number of dots received:

1st place - Proposal #8. Subdivide the Pool into 3 interconnected units approximately 5,000 acres in size. Treat each unit on a 7 to 10 year cycle as follows. (41 dots)

2nd place - Proposal #7. Subdivide the Pool into 2 interconnected units that would result in an approximately 5,000 acre Pool and an 11,000 acre pool. (31 dots)

3rd place - Proposal #9. Subdivide the Pool into 6 interconnected units of varying size (1990 Proposal). (24 dots)

4th place - Proposal #5. Experiment with managing the Pool level between full Pool and 6 inches above full pool during the period February through October to see if the levees can sustain the pressure (conduct managed draw-down). (6 dots)

5th place - Proposal #6. Continue to manage the Pool level at full pool (conduct managed drawdowns). (3 dots)

The following Proposals received no support:

Proposal #10. I will provide a written proposal by June 1, 2005.

Proposal #4. Attempt to manage the Pool level far above full pool (1 foot above full pool or higher, wait for natural events to draw down the Pool).

Proposal #3. Manage the Pool level at Full Pool (wait for natural events to draw down the Pool).

Proposal #2. Rebuild the entire dike system to accommodate the highest water level possible (wait for natural events to draw down the Pool).

Proposal #1. Take no action.

PROPOSAL 8

Subdivide the pool into 3 interconnected units approximately 5,000 acres in size. Treat each unit on a 7 to 10 year cycle as follows.

Treat each unit on a 7 to 10 year cycle as follows. Once every 7 to 10 years draw one unit completely down during the spring to allow for oxidation and conduct a prescribed burn to set back natural succession and dispose of accumulated dead plant material. Get advance permission to conduct prescribed burns during severe fire danger conditions.

Use mechanized equipment wherever practicable to build fish passage ways and deep ponds so that fish would have escape routes to deeper water during droughts or cyclic draw downs.

Restock the fisheries resource as needed based on lessons learned from the 1999-2000 drought.

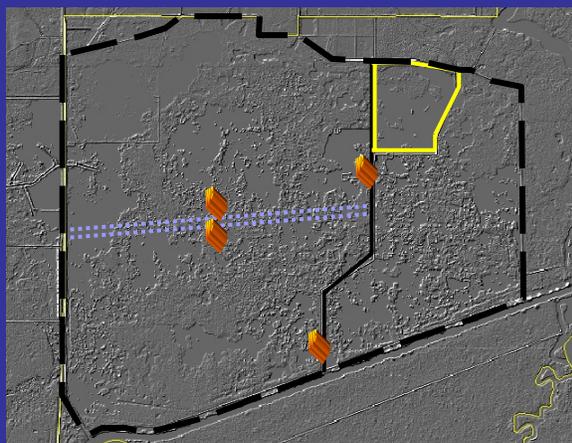
Provide additional boat launching sites, water control structures and water pumping devices as needed to maintain the maximum water management capability possible.

Develop a water management plan for each unit as they are rehabilitated that benefits fish and wildlife.

The remaining units awaiting their initial sediment treatment would continue to be open to fishing. Spillways will be set to hold water 6 inches above full pool or at full pool from February 28 to November 1. From November 1 until February 28 water control structures will be set to hold water at 1ft below full pool.

Once a unit is treated it will be held at full pool February 28 to November 1 and from November 1 until February 28 lowered as needed for migratory bird management.

Proposal 8



Options

-  Unit D, already existing
-  Levee with Water Control Structures
-  Create Levees and center canal
-  Outer Boundary of Waterfowl Mgt Unit-G
-  Water Control Structure With boat access

Mr. Voros informed the participants that the higher-ranked proposals will be remolded into management alternatives which will appear in the Comprehensive Conservation Plan that the public will have an opportunity to comment on later this year.

Meeting participants also had the chance to comment on the following feasibility study proposals:

1. Conduct a feasibility study for plant removal. (52 dots)

Conduct a feasibility study focused at the removal of dead plant vegetation that has accumulated over the last 60 years through a private entity that can sell the material as topsoil or peat on the open market. Concurrently the study should also investigate the feasibility of mechanically removing floating aquatic vegetation with the best available technology. The study would determine what the permitting requirements would be and if it can be a financially and environmentally viable project. If the project is viable implement it in conjunction with one of the other alternatives identified.

2. Conduct a feasibility study relating to the use of explosives to blow holes in the marsh and spread the organic material around. (3 dots)

Conduct a feasibility study focused at how the use of explosives can be used to manage the Pool. The study would include an analysis of the distance that various explosive charge shock waves will travel below ground in all directions and above ground. The study would also provide examples of how this technique has been effectively used in the past in Louisiana coastal marshes that support oil and gas infrastructure. The study should include an analysis of potential impacts to oil and gas facilities above and below ground, oil and gas reservoirs, adjacent dikes, spillways, the Intracoastal Waterway and other facilities and infrastructure within the shock wave area.

3. Do not Conduct Feasibility Studies (6 dots)

Participants were informed that the potential feasibility studies are intended to be used in conjunction with one of the above management proposals. Support or non-support for a given feasibility study will aid in determining if the Fish and Wildlife Service moves forward with this initiative in conjunction with one of the above proposals or an alternative proposal which may be developed in the future.

Appendix F - Compatibility Determinations

Introduction

These compatibility determinations were prepared for Alternative B, the proposed alternative, and are contingent upon selection of this alternative and approval of the Comprehensive Conservation Plan for Lacassine National Wildlife Refuge.

Refuge Uses

The following compatibility determinations apply to 1) Berry Picking; 2) Environmental Education and Interpretation; 3) Recreational Freshwater Sportfishing; 4) Recreational Freshwater Sportfishing Tournaments; 5) Recreational Hunting; 6) Research and Monitoring; 7) Wildlife Observation and Photography; 8) Commercial Alligator Harvest; 9) Commercial Video and Photography; 10) Commercially Guided Wildlife Viewing, Photography, Environmental Education, and Interpretation; and 11) Cooperative Farming.

Refuge Name

Lacassine National Wildlife Refuge

Date Established

December 30, 1937

Establishing and Acquisition Authorities

Executive Order 7789; Migratory Bird Conservation Act; Fish and Wildlife Act of 1956

Refuge Purpose(s):

For lands acquired under Executive Order 7780, dated December 30, 1937, the purpose of the acquisition is "... as a refuge and breeding ground for migratory birds and other wildlife ..."

For lands acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d, the purpose of the acquisition is "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

For lands acquired under the Fish and Wildlife Act of 1956, the purpose of the acquisition is "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." [16 U.S.C. 742f (a) (4)] and "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." [16 U.S.C. 742f (b) (1)].

Mission of the National Wildlife Refuge System

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."

Other Applicable Laws, Regulations, and Policies

Antiquities Act of 1906 (34 Stat. 225)
Archaeological Resources Protection Act of 1979
Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; 54 Stat. 250)
Criminal Code provisions of 1940 (18 U.S.C. 41)
Department of Interior, U.S. Fish & Wildlife Service, Code of Federal Regulations, Title 50, Subchapter C; Title 43, 3101.3-3)
Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.; 87 Stat. 884)
Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)
Fish and Wildlife Service (Refuge) Manual
Land and Water Conservation Fund Act of 1965
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755)
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715r; 45 Stat. 1222)
Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718-718h; 48 Stat. 451)
The National Environmental Policy Act of 1969 (42 U.S.C. 4321, et seq.; 83 Stat. 852)
National Historic Preservation Act of 1966 (16 U.S.C. 470, et seq.; 80 Stat. 915)
National Wildlife Refuge System Administration Act of 1966 as amended (16 U.S.C. 668dd-668ee; 80 Stat. 927)
National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-570)
Native American Graves Protection and Repatriation Act of 1990
Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)
Refuge Revenue Sharing Act of 1935, as amended in 1978 (16 U.S.C. 715s; 92 Stat. 1319)
Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41; 62 Stat. 686)
Use of Off-Road Vehicles on Public Lands (Executive Order 11644, as amended by Executive Order 10989)
Wilderness Act of 1964 (16 U.S.C. 1131; 78 Stat. 890)
Laws and Regulations of the State of Louisiana relating to hunting
Additional refuge-specific regulations as published

Compatibility determinations for each use listed were considered separately. Within this plan, the preceding section from "Refuge Uses: through "Other Applicable Laws" are only shown once; however, they are part of each descriptive use and become part of that compatibility determination if approved.

Description of Use:***Berry Picking***

The refuge will allow berry picking and collection of other fruits and nuts on select areas of the refuge for personal use only. Blackberries are the most widespread berry along refuge levees during spring and summer. Collection of berries for the purpose of human consumption has occurred at a very low level on the refuge in the past. Therefore, the removal of berries for human consumption is not significantly impacting the availability of this naturally occurring food for wildlife, due to its widespread distribution on refuge levees. Collecting berries, fruits, or nuts from the refuge for commercial purposes (e.g., selling for a profit) is not allowed and/or covered by this compatibility determination.

Availability of Resources: At the current level of participation, resources for this use are adequate. Berry picking occurs at such a low level that additional resources are not needed or justified at this time, or in the foreseeable future.

Enrollment in the Recreation Fee Demonstration Program could enable the refuge to recover overhead expenses to oversee and administer berry picking and other public uses in the future. Participation in this program is currently being fully evaluated. It could provide a potential source of revenue to offset increasing costs to promote and manage existing and future public use opportunities, particularly the priority public uses identified in the National Wildlife Refuge System Improvement Act of 1997.

Anticipated Impacts of Use: The incidental disturbance of wildlife species, either illegally or unintentionally, may occur with any public use program. Berry picking, and collecting of fruits and/or nuts will remove food for wildlife, but due to their abundance, when present on refuge levees during spring and summer, it is not anticipated that this action will negatively impact wildlife species. The refuge staff has observed in years when berries are plentiful, many go un-eaten due to their abundance where present.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Public access for berry picking will be allowed in designated areas only during spring and summer when berries are available. An increase in law enforcement patrols will minimize illegal or undesirable activities resulting from allowing this use. Berry picking will be monitored to document any negative impacts. If and when negative impacts to wildlife are identified, corrective action will be taken to reduce or eliminate them. Public access to berry picking sites may be closed during extremely wet periods to ensure road protection and visitor safety, and to minimize wildlife disturbance.

Given the limited access (e.g., primarily by foot) berry picking is viewed as compatible with the purposes for which the refuge was established.

Justification: According to the National Wildlife Refuge System Improvement Act of 1997, berry picking is a secondary public use activity that can be considered if priority public uses are evaluated first. It is through compatible public uses, such as this, that the public becomes aware of, sees, enjoys, and provides support for national wildlife refuges.

Mandatory 10-Year Re-evaluation Date: _____

Description of Use:

Environmental Education and Interpretation

Kiosks play a key role in our capabilities to provide environmental education and interpretation at the Lacassine National Wildlife Refuge. Informational panels are present at two kiosk locations at the Lacassine Pool, at the Streeter Road “Farming for Wildlife” overlook, and on a small one-sided kiosk available at the Unit B Bank Fishing Area. The refuge headquarters unit is constructing a new kiosk to replace and improve environmental education and interpretation capabilities at this office/visitor contact station, with up-to-date information on wildlife presence and opportunities available.

Refuge brochures provide information about particular fish and wildlife species present, other natural resources, public opportunities available, and appropriate conduct while visiting. Brochures are available at four locations at the Lacassine Pool, at the Streeter Road Unit B Bank Fishing Area, and at the refuge headquarters. Brochures are also provided to Gary’s Landing and Myers Landing in Lowry—two nearby private boat launches within 1-2 miles of the refuge, and at “T’s” Grocery and Belinds Grocery in Hayes. Refuge brochures are also provided to the Southwest Louisiana Convention and Visitors Bureau in Lake Charles, to the Cameron Prairie National Wildlife Refuge in Holmwood, and to the Sabine National Wildlife Refuge headquarters, south of Hackberry.

Although a designated staff member is not available to conduct presentations and programs in nearby schools, refuge staff have met the current demand. The refuge currently conducts visits to the schools and libraries in Jennings, Elton, Lake Arthur, Welsh, Iowa, Bell City, and Lake Charles, accommodates field trips and tours, organizes volunteer groups from schools, and has provided opportunities for the Boy Scouts of America. Environmental education and interpretation are key components of all activities involving schools and Acadiana youths. At all opportunities, the refuge highlights the Fish and Wildlife Service, refuges, and wildlife and their habitats and how important conservation is in southwest Louisiana. Staff often respond to and answer questions from these groups and the public.

Availability of Resources: At the current participation level for this use resources are slightly inadequate. However, with implementation of the proposed alternative, use will increase and additional resources will definitely be required.

Anticipated Impacts of Use: The incidental disturbance of wildlife species may occur with any public use program. Environmental education and interpretation may result in some additional wildlife disturbance and temporary displacement of wildlife. Habitat destruction (e.g., mostly trampling) by approved or unapproved activity may also occur. Boardwalks, auto-tour routes, kiosks, and observation platforms are designed and placed to minimize disturbance. Visitors using the Lacassine Pool Wildlife Drive can cause considerable wildlife disturbance, particularly waterfowl in winter, if they exit their vehicle rather than remain inside as they travel the 3-mile loop. Improved education about the benefits of staying in and using a vehicle as a blind and periodic law enforcement patrols during peak visitation should minimize this disturbance factor.

Environmental education and interpretation does not negatively impact the refuge and provides the public an important opportunity to connect with the natural world, and learn about fish and wildlife in this area. Environmental education and interpretation are not expected to indirectly, or cumulatively impact refuge resources although some incidental and short-term disturbance or trampling may occur.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Environmental education and interpretation will be confined to designated sites within the Lacassine National Wildlife Refuge. Outreach and education can be taken into the classroom, incorporated into presentations, and will be used at other forums—all of which have no deleterious affect on fish and wildlife at the refuge. Educational programs with groups will be organized and supervised in a manner to reduce impacts to wildlife, disturbance, and unacceptable destruction to refuge habitat (i.e., trampling vegetation).

Justification: According to the National Wildlife Refuge System Improvement Act of 1997, environmental education and interpretation are priority public use activities that should be encouraged and expanded where possible. It is through compatible public uses such as these that the public becomes aware of and provides support for national wildlife refuges.

Mandatory 15-Year Re-evaluation Date: _____

Description of Use:

Freshwater Sport Fishing

Freshwater sport fishing with pole and line has traditionally been allowed inside the 16,000-acre Lacassine Pool freshwater impoundment from March 15 – October 15.

Only fishing with rod and reel or pole and line is permitted in refuge waters. The use or possession of any other type of fishing gear including trotlines and juglines is prohibited in all waters.

Individuals or representatives of organizations seeking to sponsor or participate in fishing tournaments on the refuge should contact the refuge manager for special restrictions.

All side canals, coves, bays, marshes and ponds off State of Louisiana waterways that traverse and surround the refuge are subject to refuge fishing regulations.

Special informational note: Freshwater sport fishing is allowed year-round in State of Louisiana waterways that traverse and surround the refuge. Certain state waterways that flow through the refuge are subject to State of Louisiana fishing regulations. These waterways include the Lacassine Bayou, Streeter Canal between the Mermentau River and Lacassine Bayou, and the Gulf Intracoastal Waterway. Anglers should consult state regulations for special restrictions in these waterways.

Availability of Resources: Freshwater sport fishing represents about 75 percent of the consumptive users on the refuge (~30,000 visitors annually). A considerable portion of the refuge budget is spent annually managing the Lacassine Pool for benefit of freshwater fisheries, conducting law enforcement patrols inside and outside the pool, and ensuring refuge visitors are in accordance with boater safety and following other refuge regulations.

Administration of the freshwater sport fishing program will require considerably more resources, particularly if and when fishing tournaments (also referred to as fishing derbies, clinics, or dog fights) are permitted. Currently, regulations are being evaluated to consider proper management of commercial-type fishing events due to public interest identified in the comprehensive conservation plan scoping meetings. Bass fishing anglers using the Lacassine Pool represent one of the most vocal segments of the public. Therefore, the refuge is evaluating all options to permit a limited number of tournaments, sufficient to maintain support from this segment of the public, but not in excess so that other users (e.g., recreational anglers, bird watchers, bank anglers, and others) will not be negatively affected. Currently, staff and resources can marginally cover management of freshwater sport fishing. If and when tournaments are allowed, additional resources will be needed to adequately manage this opportunity.

Anticipated Impacts of Use: Boat traffic inside the Lacassine Pool is beneficial due to the current abundance of dense submergent plants and lack of open water areas available for access by anglers. Boat traffic opens up travel lanes thereby creating open water, which is needed by anglers and for which is highly valuable during the sanctuary period of the year (October 16-March 14) when the Lacassine Pool is closed due to its importance for migratory waterfowl (particularly ducks). Boat traffic creates more open water in the Lacassine Pool and this is valuable to both anglers and ducks (mutually beneficial).

Boat traffic outside the Lacassine Pool in refuge waters has a negative impact on the refuge. Bank erosion, loss of adjacent upland vegetation (e.g., trees that stabilize the bank), and disturbance to aquatic vegetation, which occurs in only 5 percent of the marshes on the refuge outside the pool, are occurring due to boat traffic and excessive boat speeds. The refuge is experiencing significant land loss as a result of boat traffic from fishing, hunting, commerce, oil and gas exploration, and other sources. Fishing in itself does not impact the refuge. Freshwater sport fishing is a wholesome, enjoyable, and wildlife-dependent public use opportunity that the refuge plans to continue to promote. However, the means for which anglers must access the refuge (i.e., via boat) is having a negative impact on the refuge.

Freshwater sport fishing is a sedentary activity, in part, and participation in this activity generally results in litter on the refuge (e.g., fishing line, food, bait containers, soda/beer cans, and other “trash”). The refuge is required to retrieve trash numerous times per year in order to keep the refuge looking presentable. Trash is detrimental to the aesthetics of the refuge and can impact the digestive tract of birds, turtles, fish, alligators, and other resident and migratory wildlife.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

X Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Freshwater sport fishing will be allowed March 15–October 15 in refuge waters, the time of year with the lowest migratory bird use, and only during the hours of one hour before sunrise until one hour after sunset. Fishing from a boat, although having a negative affect outside the Lacassine Pool, will continue to be the primary method of access for anglers.

Law enforcement patrols to enforce littering and refuge fishing regulations will be a high priority need.

Current and future levels of fishing pressure are considered to be compatible with the purpose for which the refuge was established.

Justification: According to the National Wildlife Refuge System Improvement Act of 1997, fishing is a priority public use activity that should be encouraged and expanded where possible. It is through compatible public uses such as this that the public becomes aware of and provides support for national wildlife refuges.

Mandatory 15-Year Re-evaluation Date: _____

Description of use:

Recreational Sport Fishing Tournaments

Freshwater tournament fishing with pole and line has occurred on refuge waters for an unknown amount of time and has been handled since 1993, subject to special use permit conditions specific to each tournament. Most tournaments are catch and release with the largest fish kept for weighing. Fish that the angler wants to keep for the weighing are kept in a live well and culled as larger fish are caught. This use is mainly associated with the 16,000-acre Lacassine Pool. There is limited demand for fishing tournaments on other portions of the refuge.

Through the years the staff of Lacassine Refuge has identified three classes of fishing tournaments that occur on refuge: Multiple Water Tournaments; Off-site Tournaments, which focus on taking fish from the refuge, and On-site Tournaments. Descriptions of these tournaments are as follows:

Multiple Water Tournaments: These tournaments are usually sponsored by large organizations. All organizational, administrative, and judging activities occur off the refuge, usually in a centrally located municipality. These tournaments are highly publicized and have a large number of participants. Some participants may be professional anglers. The fishing activity occurs over a large geographical area, such as southwest Louisiana or a specific watershed, which may include national wildlife refuges. Numerous species of fish may be targeted or it could be a species-specific tournament. Refuges are not singled out by the tournament operators. Prizes are both monetary and material and can be of substantial value. Participants involved in the tournament may or may not choose to fish on a refuge. Local examples of these tournaments are the STAR (multiple species tournament) and National Red Fish Tournament. Because these tournaments are not targeting refuge water but a large geographical area and have a time honored tradition of managing the tournament as described above, the refuge will not regulate this form of fishing tournament.

Off-site Tournaments (target taking fish from the refuge): These tournaments tend to fall in a gray area in that you are not always sure if the tournaments are occurring, and the participants are indistinguishable from other individuals fishing on the refuge. The host of the tournament may be a

declared non-profit organization, a local entrepreneur, or an unaffiliated individual. Locally, these are often referred to as a “dog fight,” “rodeo,” and “derby.” Oftentimes these events are advertised locally within a very small geographical area. Advertisement is by word of mouth, posters in store windows, or in lesser known publications. Prizes are usually monetary. The target area for these tournaments is very explicit, such as the Lacassine Pool, where many bass have been taken that were of record size. The target species is Florida largemouth bass. Organizational, administrative, and judging activities occur off-refuge. When possible, the refuge will work with sponsors of such tournaments to advise them that the activity they are conducting requires a special use permit from the refuge.

On-Site Tournaments: These tournaments may have the same characteristics as the tournaments identified above except organizational, administrative, judging, and the fishing activities occur on-refuge. These tournaments will be managed through a recreational special use permitting program.

Availability of Resources: Tournament fishing represents a small portion of all recreational users on the refuge. Management activities associated with tournaments include: law enforcement patrols that ensure tournament participants are in compliance with state and federal boater safety regulations and are following permit and other refuge-specific regulations; administrative personnel involved in managing the permitting process; biologists needed to plan and conduct habitat management; monitoring and fish stocking; and maintenance personnel needed to conduct litter control, boat ramp, sign, and road and other maintenance. Currently, resources are available to manage a limited duration tournament program.

Anticipated Impacts of Use: As tournaments became popular on the refuge, they highlighted the fisheries resource on the refuge. They became a time-honored tradition that overshadowed managing the refuge to fulfill the purpose for which it was established. For many years this has caused some conflict between the public and refuge management officials. However, recent efforts to work closer with the public seems to have tempered former negative relationships, and a more positive working relationship with tournament sponsors and the sport fishing community have emerged.

Certain segments of the fishing community find fishing tournaments disruptive on the refuge and have complained about tournament participants dominating the waterways, roads, and parking areas, creating safety problems and in some cases exhibiting poor ethical boating and fishing behavior. Some anglers complain about finding dead fish at the weigh-in location. Other segments of the fishing community enjoy the competition and camaraderie of fishing tournaments and claim to encourage good fisheries management.

To address the various concerns among anglers, limited-duration tournaments will need to be authorized in a manner that will have minimal impacts on recreational fishing enthusiasts who are not involved in the tournaments and other natural resources.

Many tournament fishing enthusiasts come to the Lacassine Pool to fish exclusively for the Florida largemouth bass. This species has been stocked in the pool by the Louisiana Department of Wildlife and Fisheries for over 10 years. With continuing stocking efforts, the species continues to interbreed with the native northern bass. The public generally accepts that Florida bass and its hybrids are resident bass within the Lacassine Pool.

The practice of holding fish in live wells and culling smaller fish in exchange for holding larger fish for tournament purposes has caused concern among some anglers and federal and state biologists. The major concern is the spreading of largemouth bass virus. Research indicates that live-release angling tournaments cause a significant physiological disturbance in largemouth bass, specifically

with plasma cortisol, glucose concentrations, and plasma osmolarity in largemouth bass sampled five minutes following weighing (Suski et al. 2003). Tournament-caught fish are often kept in live wells for several hours, and if bigger fish are caught, the smaller fish, stressed from being in the live wells, are released.

Largemouth bass virus has been found to date to only produce disease in largemouth bass, even though other fish can carry the disease. The disease can slow growth and fish stressed by poor water quality, crowding in live wells, and frequent handling are more likely to die from the disease.

Live release angling tournaments can expose largemouth bass to periods of hypoxia (Furimski et al. 2003). Also, it has been shown that temperature is an important determinant in host survival to largemouth bass virus (Grant et al. 2003).

Roads and travel corridors to boat launching sites on the refuge can be injurious or fatal to wildlife. Vehicle incidents involving wildlife, such as reptiles, amphibians and some migratory and resident mammals and birds, have been observed on the roadways to and from boat launching sites. This situation can be partially corrected by enforcing speed limits on the refuge and making the public aware of wildlife crossing the roads.

Tournament participant's boats and trailers could accidentally release invasive aquatic plant species into the pool and certain species such as *Salvinia molesta* could be extremely detrimental if introduced. Signs are currently posted at all boat launching site, making anglers and boat owners aware of the problem and providing recommendations on how to address the matter.

During tournaments overzealous anglers could cause disturbance to nesting resident and migratory birds in the pool. Time and space zoning will be needed to address this impact.

Some tournaments, if managed proactively, could be a benefit to biologists if staff or volunteers are made available to properly handle fish and collect valuable data, such as weight, length, age, and, when appropriate, take body samples for genetic identification purposes.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Limited duration off-site largemouth bass tournaments, which focus on taking fish from the refuge, and on-site largemouth bass tournament fishing will be allowed in refuge waters from March 15–September 30, on specific dates by special use permit only and will not exceed over three tournaments per month. This is the time of year with the lowest migratory bird use on the refuge. Tournament slot dates will be identified in early February and a competitive process will be used to allocate slot dates.

The program will be managed as a Recreation Fee Program where a portion of the funds generated from the competitive allocation process will be used to maintain the public use facilities on the refuge.

The zoning of tournament activities may be used to protect nesting water birds and to alleviate congestion.

Tournament sponsors will be required to conduct their tournaments as follows:

- All bass captured will be retained and removed from the refuge at the end of the tournament. All anglers will be discouraged from holding fish in live wells and culling fish for size to aid in controlling the spread of largemouth bass virus.
- Law enforcement patrols to enforce special use permit and refuge fishing regulations will be a high-priority need.
- Will be required to exhibit proof of insurance for potential damages to facilities or habitat as a result of tournament activities.

Justification: Sport fishing tournaments, as regulated by special use permit, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose(s) of Lacassine National Wildlife Refuge.

Mandatory 10-Year Re-Evaluation Date: _____

References:

Furimsky, M, Cooke, S. J., Suski, C. D., Wang, Y., and B. L. Tufts. 2003. Respiratory and circulatory responses to hypoxia in largemouth bass and smallmouth bass: implications for “live release” angling tournaments. *American Fisheries Society. Transactions*, 132(6): pp. 1065-1075; 2003 ISSN: 0002-8487. Allen Press.

Grant, E. C., D. P. Philipp, K. R. Inendino, and T. L. Goldberg. 2003. Effects of temperature on the susceptibility of largemouth bass to largemouth bass virus. *Journal of Aquatic Animal Health*, 15(3): pp. 215-220; ISSN: 0899-7659. Allen Press.

Suski, C. D., Killen S. S., Morrissey, M. B., Lund, S. G., and B. L. Tufts. 2003. Physiological changes in largemouth bass caused by live-releasing angling tournaments in southeastern Ontario. *North American Journal of Fisheries Management*, 23(3): pp. 779-786; ISSN: 0275-5947. Allen Press.

Description of Use:

Hunting

Waterfowl hunting and white-tailed deer hunting opportunities are available on the refuge. Waterfowl hunting is available in conjunction with the annually set (variable) duck season, although the refuge currently allows hunting on Wednesday-Sundays (5 consecutive days a week). Proposed modification to the hunting dates for waterfowl season may be changed to Wednesday-Thursday and Saturday-Sundays only per week in the near future. The refuge is closed during the goose-only hunting season. White-tailed deer hunting is available October 1-31 annually using archery equipment only. The beginning of the State of Louisiana archery season may begin prior to October 1, but the refuge does not allow archery hunting on the refuge prior to October 1. Waterfowl hunters and white-tailed deer archers must remove hunting equipment from the refuge daily (i.e., no deer stands, blinds, decoys, piroques, or other hunting-related equipment may be stored on the refuge).

Waterfowl hunting is available on 10,434 acres, which includes an 850-acre site that provides walk-in hunting access for youths/seniors selected via a special drawing lottery hunt. The notification and selection of participants for the hunt and lottery are held from September-October each year. The refuge provides 4-8 blinds annually. Youth hunts occur on Saturdays and senior hunts occur on Wednesdays during the state-designated waterfowl season. The refuge does not provide decoys or materials to further camouflage the pit blinds. The blinds are capable of holding 3 hunters each (two youths or seniors; and one adult 21 years of age or older). A minimum of one youth must possess proof of completing a state certified hunter safety course (can be the applicant or an identified guest). Successful applicants are offered one or more scout days prior to the opening of the hunting season. In addition to the special youth/senior lottery hunt, a lottery drawing is held for the 400-acre Duck Pond--a managed hunt area. A drawing is held in conjunction with the youth/senior lottery drawing to select participants for a managed hunt occurring only on Wednesdays and Saturdays. Applicants/guests are not required to meet refuge personnel the morning of their hunt. The hunt is a self-regulated lottery hunt. However, all participants are required to complete the harvest form in order to be considered for future hunts. This information is critical to the proper evaluation of the special lottery hunt.

The white-tailed deer harvest is limited to an archery season only. Archers may harvest a maximum of one buck or one doe per day. The state allows deer hunters to harvest six deer total (all methods) per year. The refuge archery season is open annually for all dates in October. The entire refuge is open to archery hunting except for the headquarters unit and 45-acre field surrounding the maintenance facility at the Lacassine Pool. Areas closed are posted. Bowhunters participating in the refuge white-tailed deer archery hunt must possess a signed copy of the refuge hunting permit and proof of completing an accredited Louisiana Bowhunters Safety Course.

All-terrain vehicle use is restricted to disabled hunters on designated routes of travel only. Disabled hunters using all-terrain vehicles on the refuge must possess proof of a state certified disability.

Availability of Resources: There are adequate resources to ensure and administer the use at its current level of participation. However, additional resources may be required for resource protection and administration as participation grows.

Anticipated Impacts of Use: The incidental taking of other wildlife species, either illegally or unintentionally, may occur with any consumptive-use program. At current and anticipated public use levels for this program this incidental take will be very small, and will not directly or cumulatively impact population levels on the refuge or in the surrounding area. Currently, the refuge does not have any threatened or endangered species so concerns about incidental take of protected species are non-existent. Implementation of a highly effective law enforcement program and continued development of special regulations for this use will eliminate most incidental take problems.

Hunter access to the hunt areas is limited to walking only, with the exception of all-terrain vehicle use by disabled hunters, so impacts such as trampling and noise disturbance should be minimal.

Hunting is not expected to indirectly or cumulatively impact refuge resources negatively. As a consumptive use, hunting will have some minimal and short-term direct impacts on refuge resources.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Waterfowl hunting is open to the general public, although special lottery and managed hunts are available to youth and seniors. All youth, no more than two per blind, must be supervised by an adult 21 years of age or older. Hunters must hunt from designated blinds only. The waterfowl season will follow the framework of the state regulated season. Waterfowl hunting dates and shooting hours ending times are refuge-specific. Permits are required and a post hunt information card must be completed following each hunt.

The archery only white-tailed deer season will be open only for a period that corresponds with a closed state waterfowl season. Parking is allowed in designated areas. Boat access from inside the Lacassine Pool for archery season is available only between October 1-15.

Current and future levels of hunter participation are considered to be compatible with the purpose for which the refuge was established.

Justification: According to the National Wildlife Refuge System Improvement Act of 1997, hunting is a priority public use activity that should be encouraged and expanded where possible. It is through compatible public uses such as this that the public becomes aware of and provides support for national wildlife refuges.

Mandatory 15-Year Re-evaluation Date: _____

Description of Use:

Research and Monitoring

Research includes experiments and monitoring to increase one's knowledge of ecosystem function and local responses to management actions to attain the goal of more efficient and productive habitat management. This activity will allow university students and professors, and non-governmental and governmental researchers to conduct both short- and long-term research projects. Results of this research will allow managers to assess the success of management activities and develop a library of "Best Management Practices" on a refuge-specific basis. All research requests will be evaluated on a project-by-project basis to determine merit and applicability to refuge programs.

Availability of Resources: Research conducted by other organizations will assist refuge staff to establish baseline monitoring at or above the current level to improve data management, analysis, interpretation, and implementation. Current staffing levels are not adequate to fully monitor all refuge programs and responses.

Anticipated Impacts of Use: There can be negative impacts from scientific research and monitoring on the refuge. Impacts, such as trampling vegetation, all-terrain vehicle use, and temporary disturbance to wildlife, will occur. Individual plants or animals may be handled, collected, and/or removed from the refuge permanently for further study. These collections will not likely adversely affect refuge plant and animal populations overall. Removal of plants and animals from the refuge, or

conversely, introduction of non-native plants and animals must be carefully monitored and controlled. Other important impacts from research and monitoring may include: (1) noise disturbance from helicopter, airplane, airboat, truck, or car could likely temporarily displace wildlife; (2) physical presence of people or equipment could temporarily displace wildlife; (3) ground and marsh disturbance by stirring sediments from walking on site or the use of equipment; (4) water disturbance from equipment or walking; and (5) increased predation on animal species being investigated due to trails, human scent, and frequent activity in an identifiable area. Despite these impacts, the knowledge gained from carefully considered and properly exercised scientifically defensible research will provide information and justification to improve management techniques and better meet the needs of trust resource species.

Research and monitoring activities on the refuge are not expected to indirectly or cumulatively impact refuge resources negatively even though some minimal short-term and direct impacts may occur.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: All researchers will be required to obtain and possess a special use permit from the refuge. Individual requests to use specialized equipment (e.g., all-terrain vehicles and airboats) will be evaluated on a project-by-project basis and justified or not on each permit. Researchers will periodically be evaluated for compliance of all special use permit requirements. Periodic progress reports will be required and final copies of all reports and publications will be provided to the refuge. The refuge will not directly supply personnel or equipment unless arrangements were made prior to issuance of the special use permit. The refuge manager reserves the right to delegate a staff member to accompany permittee(s) at any time. All plants or animals sampled, collected, or released must be done so in a scientifically accepted manner as specified by professional scientific societies, such as the Society for the Study of Amphibians and Reptiles, the American Society of Mammologists, the American Ornithological Society, the Ichthyologists League, the Entomological Society of America, and the Botanical Society of America. Under the guidance listed above for the appropriate species, incidental take and inadvertent trampling is expected to be minimal and will be addressed with each permit request.

Given compliance with the restrictions set in each special use permit, research conducted on the refuge is considered to be compatible with the purpose for which the refuge was established.

Justification: The benefits from sound research and monitoring provide a better understanding of species, habitats, and the environmental communities present on the refuge. Implementation of the proposed alternative will require additional monitoring and/or research to evaluate and re-evaluate the management programs used on the refuge. The benefits, however, greatly outweigh any short-term disturbance or loss of individual plants or animals that may occur.

Mandatory 10-Year Re-evaluation Date: _____

Description of Use:***Wildlife Observation and Photography***

The refuge will allow wildlife observation and photography on select areas of the refuge. Photography is encouraged while engaging in other permitted public use activities. The refuge has no photography blinds available, however the temporary use of a portable blind is permitted. The refuge offers a 3-mile wildlife drive (i.e., automobile-accessible tour road) at the Lacassine Pool Unit. This wildlife drive circumnavigates an area with abundant wildlife (e.g., waterfowl in winter; rookery, wading birds, and alligators in summer) and provides an outstanding opportunity for the public to view wildlife at a safe, close range.

Observation platforms and/or boardwalks are provided at the headquarters site, Streeter Road, and at the Lacassine Pool to enhance public participation and to minimize disturbance to wildlife. Spotting scopes are provided on all elevated observation platforms and most facilities are handicapped-accessible. Much of the refuge is adjacent to and associated with major state waterways (i.e., Mermentau River, Lacassine Bayou, Grand Lake, and Gulf Intracoastal Waterway), which are accessible by boat.

Given the refuge's proximity to the Gulf of Mexico, neotropical migratory songbirds may spend considerable time using refuge resources during their trans-gulf flight. When this occurs, bird watchers are permitted and encouraged to hike into other accessible areas on the refuge.

Availability of Resources: At the current level of participation, resources for this use are adequate.

Enrollment in the Recreation Fee Demonstration Program and/or initiating fees for leaflets and brochures supporting existing and future hunting and fishing programs, including fees for boat launch, special hunts, commercial hunting and fishing guides, etc., will all be considered as a potential source of revenue to offset costs to promote and manage existing and future public use opportunities, particularly the priority public uses of the Refuge System.

Anticipated Impacts of Use: The incidental disturbance of wildlife species, either illegally or unintentionally, may occur with any public use program. Wildlife observation and photography may result in some additional wildlife disturbance. Habitat destruction (mostly trampling) by approved or unapproved activity may also occur. Boardwalks, auto-tour routes, observation platforms, and photo blinds (if made available) are designed and placed to minimize wildlife disturbances. Wildlife in these areas frequently become accustomed to usage patterns and over time become tolerant of normal observation techniques. Signs and interpretive panels are placed on the auto-tour route and other public use areas, informing the public of this fact. Frequently, users of the Lacassine Pool Wildlife Drive will get out of their vehicle and disturb wildlife. Effective educational and law enforcement programs should seek to minimize this disturbance factor.

Wildlife observation and photography are not expected to indirectly, or cumulatively impact refuge resources negatively even though there may be some minimal and direct short-term disturbance or trampling.

Photography as described in this compatibility determination refers to amateur photography only. Professional photographers seeking to capture images of wildlife or nature for purposes of distributing them for profit are not covered or authorized to proceed under this compatibility determination. A special use permit is required for commercial activities or any income-generating activity on a national wildlife refuge.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Public access for wildlife viewing and photography will be allowed in designated areas only. An increase in law enforcement patrols will minimize illegal or undesirable activity. Wildlife observation and photography will be monitored to document any negative impacts. If and when negative impacts to wildlife are identified, corrective action will be taken to reduce or eliminate them. Public access to many of the key observation and photography areas may be closed during extremely wet periods for road protection and visitor safety. Newly constructed viewing areas will be designed to minimize disturbance impacts to wildlife and other refuge resources while providing the best possible opportunity to view wildlife in their natural environments.

Given the limited access (primarily by foot) wildlife viewing and photography is viewed as compatible with the purpose for which the refuge was established.

Justification: According to the National Wildlife Refuge System Improvement Act of 1997, wildlife observation and photography are priority public use activities that should be encouraged and expanded where possible. It is through compatible public uses such as this that the public becomes aware of and provides support for national wildlife refuges.

Mandatory 15-Year Re-evaluation Date: _____

Description of Use:

Commercial Alligator Harvest

Since the re-establishment of alligator harvests in Louisiana in 1983, the refuge has cooperated with the Louisiana Department of Wildlife and Fisheries in the commercial harvest of alligators. The attachment, titled "Justification for the Commercial Harvest of Alligators," describes alligator ecology and harvest history for this species in southwest Louisiana and on the refuges on the Southwest Louisiana National Wildlife Refuge Complex. The attachment also discusses refuge objectives and goals as they relate to the management of alligators.

Availability of Resources: Adequate refuge personnel and other resources are available to manage alligator harvest activities at present levels.

Anticipated Impacts of Use: Commercial harvest of alligators could result in some disturbance to wildlife adjacent to the hunted areas, especially those areas associated with canals. Some minimal trampling of vegetation may also occur near harvest sites. However, it is anticipated that this disturbance will be minimal. Hunt areas are designed and placed to minimize disturbance potential.

Alligator harvests are not expected to indirectly, or cumulatively impact refuge resources negatively even though there may be some minimal and direct short-term disturbance or trampling.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Commercial harvest of alligators will be allowed in designated areas only. Activities will be monitored to document any negative impacts to alligator populations and other wildlife. If negative impacts are found, corrective action will be taken to reduce or eliminate these impacts. Access to key hunt areas may be closed during adverse weather conditions for protection of infrastructure (i.e., roads and levees) and hunter safety.

To minimize impacts on refuge lands and resources, law enforcement patrols, in conjunction with a mandatory check system for biological information, will be routinely conducted in an effort to maximize compliance with policies, rules, and regulations. The following stipulations apply to special-use permits issued for commercial harvest of alligators:

- Quotas will be assigned yearly. Permittee must take all alligators harvested until his/her quota is filled, beginning with the day after Labor Day and extending continuously for a total of a 10-day period.
- The refuge manager has the authority to cancel this permit and/or reduce quotas based on alligator population data and refuge management objectives. Special conditions and quotas will be issued prior to the season. Violation of any federal, state, or refuge regulation, or special condition will result in immediate cancellation of the permit and all alligators will be seized.
- Permittee will furnish all needed equipment, including licenses and tags, which must be ready prior to the season. Permittee may not use refuge equipment.
- Permittee will be allowed to use mudboats, go-devils, and motors over 25 horsepower during the hunting season, and while scouting and baiting hooks, unless otherwise authorized. No airboats will be allowed. Any other form of transportation will require prior refuge approval. General access to harvest units will be as defined by the refuge manager.
- Each alligator set must be made clearly visible by marking each alligator set pole with orange surveyor's flagging 12 to 15 inches long, making sure all sets are well flagged to ensure daily checking and removal of sets. Permittee will provide the refuge with a map of sets when requested by refuge officials.
- No alcohol possession while on the refuge.
- Boats operated on the refuge before sunrise and after sunset must be operated with running lights.
- Permittee must personally hunt the unit each morning, and arrive on the refuge one hour before sunrise to begin harvesting alligators at official sunrise. The permittee must check all refuge lines before hunting in other areas. No nighttime hunting is permitted. Permittee's assistants must have a state helper's license if they shoot. In the event of illness or injury, a designated assistant may hunt the unit for the permittee with prior approval. If permittee

decides not to hunt, he or she must notify the refuge manager no later than one week before the start of the season. When this occurs, an alternate hunter will be given the opportunity to assume the permit for the remainder of permit (3 years maximum). The permittee will be eligible for subsequent permit drawings under these circumstances.

- Permittee may take alligators by using set pole, line, and baited hooks only. Wildlife is not permitted to be used as bait. Firearms (minimum caliber of 22 magnum) may only be used to kill hooked alligators. If shotguns are used, only 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. Caution must be used when using firearms because of the presence of fishermen and other individuals on the refuge during the season. Permittees are responsible for human safety near their sets and are encouraged to ask the refuge manager for guidance. No sets will be allowed in areas that jeopardize the health of other refuge users. Sets placed near areas of public use (i.e., active boat travel ways, roadside canals, and boat launches) need to be placed in such a way so not to jeopardize human safety or alternative sites should be used.
- All hooked alligators will be killed immediately. Each alligator must be tagged immediately after being killed. No high grading will be permitted. If a hooked alligator has been chewed or partially eaten by another alligator, it will be tagged regardless. No cuts will be allowed behind the head or at the base of the tail. Under no circumstances will permittee transport an untagged alligator.
- Each permittee is responsible for collecting information on each alligator caught. Data sheets will be provided on which each permittee must record the state tag number he or she placed on the alligator along with the length, tail girth, sex, the numbers from any metal tags found in the feet of each animal, location of missing scutes, and comments on the general condition of the animal (e.g., missing legs, scars, and missing tails). Completed alligator data sheets will be provided daily to the refuge where permittee is hunting. Each alligator will be identified by its state tag number.
- If permittee uses all tags and has extra alligators on lines, he or she is responsible for notifying the refuge law enforcement officer or refuge manager. Permittees who still need alligators will be notified by the refuge law enforcement officer or refuge manager and will take other permittee's alligators as instructed. If the quota is filled on a weekend, notification can be on the next business day. Sale manifest must be provided to the refuge office within three days.
- Permittee will remove all alligator sets and markers within 24 hours of either the close of the season or after their assigned quota is reached, whichever comes first.
- Permittee will remove all personal equipment such as boats, trailers, or other gear from the refuge within 24 hours of the end of the season or after their assigned quota is reached, whichever comes first. Permittees are allowed to leave a maximum of two boats and/or equipment on the refuge while harvesting, although the refuge is not responsible for theft, damage, loss, etc.
- Meat and all other merchantable parts of the alligators will be disposed of according to state regulations.
- Permittee may sell either whole alligators or alligator hides and meat.
- When whole alligators and hides are sold, the permittee must sell for no less than the minimum market price. Alligator hides must be sold to the highest bidder. Financial irresponsibility is justification for grounds in revoking this permit. Selling below the current market value constitutes a waste of natural resources. Permittee is responsible for all alligators taken and for paying the Fish and Wildlife Service 40 percent of the gross value at time of sale. When an alligator(s) and/or its hide(s) are destroyed, ruined, or determined as missing, or no payment is received from the buyer, insufficient checks are issued by the

buyers, or any other similar circumstances, the Bill for Collection will be based on 40 percent of the expected gross sales price per foot during that particular alligator season.

If the Service does not receive payment for any hide(s) and/or alligator(s), the permittee will be in violation of the special use permit and will be subject to civil prosecution, as well as termination of the special use permit.

Permittee is responsible for carrying a flexible tape measure to ensure all bonus tags are on alligators less than six feet and proper biological measurements are taken. All unused Louisiana sale tags will be turned over to the refuge.

Given limited access and timing restrictions, commercial harvest of alligators is viewed as compatible with the purpose for which the refuge was established.

Justification: Following the enactment of the National Wildlife Refuge Improvement Act of 1997, many refuge operation policies and uses have been reviewed. One such activity currently being reviewed for Southwest Louisiana National Wildlife Refuge Complex, consisting of Cameron Prairie, Lacassine, Sabine and Shell Keys National Wildlife Refuges, is the commercial alligator harvest.

Current policies preclude commercial operations on refuges other than for biological reasons. The following report was written to assess biological reasons for continuing the current alligator harvest or to identify required changes to the current alligator harvest strategy.

Ecology

Alligators are opportunistic feeders (McIlhenny 1935). McIlhenny (1935) stated that at sometime in an alligator's life it will eat every living thing coming in range of its jaws. Many authors agree that a relationship exists between alligator size and the type of food eaten (Giles and Childs 1949; Valentine et al. 1972; McNease and Joanen 1977; Wolfe et al. 1987). Studies have indicated that alligators less than 1.5 m (4.9') in length feed primarily on crustaceans, fishes, and insects (Giles and Childs 1949; Fogarty and Albury 1968; Valentine et al. 1972; McNease and Joanen 1977; Wolfe et al. 1987; Elsey et al. 1992), while larger alligators eat primarily mammals, fishes, crustaceans, and birds (Valentine et al. 1972; McNease and Joanen 1977; Wolfe et al. 1987; Shoop and Ruckdeschel 1990; Borden-Billiot, unpub. data).

McNease and Joanen (1977) reported that alligator diets are mainly determined by availability and vulnerability of the prey species. If these factors are equal for prey species in an area, then selecting the largest food available should maximize feeding efficiency (Wolfe et al. 1987). Nutria (*Myocaster coypus*) and muskrats (*Ondatra zibethica*) fulfill these criteria for much of the alligator's range. Because of the high reproductive rate of both prey species (Perry 1982; Willner 1982), it is unlikely that alligator predation has a long-term effect on their populations (Wolfe et al. 1987). It is likely that substantial numbers of muskrats and nutria are taken in areas where they coexist with alligators (Wolfe et al. 1987).

Food habit studies that considered prey volume rated birds among the major food items for alligators (McIlhenny 1935; Valentine et al. 1972). Birds taken by alligators have been predominantly common resident water birds including: gallinules and rails (Gruiformes) (Borden-Billiot unpub. data), herons, egrets, and bitterns (Ciconiformes), and mottled ducks (*Anas fulvigula*) (Giles and Childs 1949; Valentine et al. 1972, Elsey et al. 2004). The alligator may be the single, most efficient predator of adult mottled ducks and ducklings (Stutzenbaker 1984, Elsey et al. 2004) and is one of the most common predators of Rallidae species and their nests (Grieg 1994; Reid et al. 1994). Migratory

waterfowl generally do not arrive on the Complex until cooler temperatures exist. This cooler weather leads to winter dormancy and reduced feeding activity by alligators (Neill 1971, Delany 1986).

Amphibians are rarely reported as alligator foods, but reptiles, especially turtles and snakes, are frequently eaten (Wolfe et al. 1987; Gibbons 1990). It has been suggested that prey items, which are resistant to digestion, such as mammals, birds, and crustaceans, may tend to be over-represented while rapidly digested prey species, such as amphibians and fish, may be under-represented in food studies (Delany and Abercrombie 1986).

Alligators are cannibalistic (Giles and Childs 1949; Valentine et al. 1972; Nichols et al. 1976; Taylor 1980; Delany and Abercrombie 1986; Rootes and Chabreck 1993). The most recent evaluation of cannibalism was conducted on Lacassine National Wildlife Refuge, where Rootes and Chabreck (1993) discovered that this behavior is an important population regulating mechanism. It was estimated that cannibalism accounted for 50.2 percent of total hatchling mortality and 63.7 percent of total mortality in alligators 11 months and older (Rootes and Chabreck 1993). Mortality due to cannibalism may be distributed proportionately among all cohorts in the 0.4-2.1 m (1.2-6.9') total length (TL) size classes (Rootes and Chabreck 1993). Males and females were eaten in the same proportions as they occurred in the population (Rootes and Chabreck 1993).

History of Louisiana Alligator Harvest

Numerous accounts of alligator hunting dating as far back as 1718 can be found in Joanen and McNease 1987. McIlhenny (1935) estimated that 3 to 3 ½ million alligators were harvested in Louisiana from 1880 to 1933. Sabine National Wildlife Refuge harvested about 1,000 alligators per year from 1946 to 1951 (SNWR-ANR 1946-1951). The alligator population showed signs of decline during the early 1950s. With the larger alligators becoming difficult to harvest following population declines, tanners established new markets for smaller sized skins.

Exploitation of the alligator continued in Louisiana until 1962 when the State of Louisiana prohibited the taking of alligators. Since then, Louisiana has made a concentrated effort to scientifically manage this valuable resource. Alligator numbers today are estimated to be near those which existed at the turn of the century (Joaanen and McNease 1987).

After 15 years of research, extensive law enforcement efforts and the enactment of effective state and federal laws governing the taking, possession, and transportation of alligators and their products, Louisiana's first scientifically managed alligator harvest was initiated in 1972, with the purpose of providing a sustainable yield of alligators in to the future. Lacassine National Wildlife Refuge's first alligator harvest since 1951 was held in 1983.

Annual harvest of the alligator is based upon population estimates derived from aerial nest censuses conducted each year. Aerial surveys of the coastal marsh zone have been conducted annually since 1970. Coastal alligator habitat is subdivided into three major subdivisions according to origin: the Chenier Plain, Sub-Delta and Active Delta Zones. Each subdivision is further divided based on vegetation and salinities. Over the years, approximately 4 percent of the annual population estimate has been allotted for harvest.

The overall alligator population increased dramatically (10.1 percent annually) in the Chenier Plain (southwestern Louisiana) zone between 1970 and 1983. Alligator densities of the Chenier Plain were estimated at 1 alligator per 5.4 acres (Joaanen and McNease 1987). Privately owned property, 90 percent of which was hunted, showed an increase of 11.0 percent, whereas refuges and wildlife

management areas, where only limited hunting occurred, had an increase of 9.7 percent over the same 14-year period (Joanen and McNease 1987).

There were 100,712 alligators harvested throughout Louisiana between 1972 and 1983. Harvest strategies are geared to harvest primarily males and immature animals of both sexes. Telemetry studies (Joanen and McNease 1970, 1972; McNease and Joanen 1974) suggest that a September hunt, restricted to daytime hunting and open water areas, will result in a harvest that protects reproductive female alligators.

Refuge Alligator Harvest Goals

The goal of the refuge alligator harvest is to maintain a viable alligator population while limiting the alligator's influence on other species and/or user groups on the refuge. Actual alligator population goals have not been formally established at any of the refuges within the Complex. According to the Sabine National Wildlife Refuge Master Plan (1963) and the Sabine National Wildlife Refuge Hunt Plan (1980) the recommended population range for the refuge was 5,000 - 7,000 alligators. When the plans were written there were an estimated 9,000 alligators on the refuge. Current population estimates for Sabine National Wildlife Refuge range from 22,000-39,775. Alligator populations statewide and on the refuges have increased dramatically over the past 40 years. It is apparent that alligator population goals need to be established or updated for each of the three refuges.

Available population estimates for the Chenier Plain could be used as a reference to set goals. The alligator population increased at a dramatic rate (10 percent per year) between 1970 -1983. Louisiana Department of Wildlife and Fisheries estimated an average of one alligator per 5.4 acres from 1970 through 1983. The following table uses this alligator density estimate to calculate a possible population goal for each of the refuges.

Louisiana Department of Wildlife and Fisheries alligator density estimate (1970 – 1983) used to calculate refuge population goals			
Refuge	Acres	Ratio of alligators to acres	Calculated Population Goal
Cameron Prairie	9,621	1:5.4	1,782
Sabine, East Cove Unit	14,927	1:5.4	2,764
Sabine	124,511	1:5.4	23,058
Lacassine	27,035	1:5.4	5,006

The 1970 -1983 average population numbers were 60 percent greater than 1972 populations when the state set its first alligator harvest season. The population numbers at that time were considered sufficient to allow alligators to recover from catastrophic events.

Based on the annual estimated number of nesting females on each refuge, the Louisiana Department of Wildlife and Fisheries estimated that the 2004 alligator population for each of the refuges was:

Refuge	Number of alligators
Cameron Prairie	12,735
Sabine, East Cove Unit	8,440
Sabine	86,464
Lacassine	23,905

These numbers are far above the calculated population goals for the refuges and with state take being limited to less than 5 percent of the estimated number of alligators, there appears to be little chance for overharvest and decreased opportunities for public viewing of alligators. Since the establishment of the sustainable alligator harvest program (1972), the Louisiana Department of Wildlife and Fisheries has concluded that the alligator population has generally continued to increase (LDWF 1999). Nest count trends continue increasing with each year, which in turn may indicate a growing population.

The Louisiana Department of Wildlife and Fisheries, in cooperation with the Complex, conducts intense surveys of federal refuges as part of their regular state-wide surveys. This ecosystem-wide approach has built working relations among the agencies, and accomplishes the refuge objectives. These coordinated surveys provide the refuges the opportunity to determine if the refuge alligator population trends coincide with state population trends. If discrepancies are discovered in population trends, harvest modifications could be implemented.

Biological Implications of Alligator Harvest

If alligator harvest is reduced or removed from refuges, alligator populations may continue to increase to a point that may negatively impact both their populations and populations of other fish and wildlife. As populations increase, growth rates decline affecting survivorship. Rootes (1989) indicated that growth rates in young alligators can greatly affect survivorship. Survivorship in sub-adult alligators has been shown to be a function of size, with survivorship increasing as size increases (Nichols et al. 1976). Jacobsen and Kushlan (1989) suggest that if an alligator grows slower, it will take longer to reach sexual maturity and increase its susceptibility to predation, disease and cannibalism. A study of growth levels in juvenile alligators at different stocking densities indicated that all alligators continued to grow during the experiment, but alligators maintained at lowest stocking density were significantly heavier and grew significantly faster than alligators at the highest stocking density (Elsley et al. 1990). These results indicate that crowding of juvenile alligators inhibits maximum growth rates. Studies of other crocodylian species have also shown this reduction in growth in overcrowding situations. In a study on growth of *C. johnstoni* in a controlled environmental chamber, Webb et al. (1983) noted that density was an important determinant of mortality and food conversion rates, with animals at the lowest density showing the highest food conversion rate.

Several studies on levels of reproduction hormones due to acute stress have also been conducted. Over-population or crowding has been shown to cause stress. Elsey et al (1990) reported that elevated levels of plasma corticosterone levels in alligators maintained at high stocking densities had a direct correlation with lower nesting success. Elsey et al. (1991) indicated that females had elevated levels of hormones (plasma estradiol- β & corticosterone) due to stress. Elsey et al. (1990a)

showed lower levels of testosterone in male alligators when subjected to acute stress. Lower levels of testosterone in males would also have a negative correlation with reproduction.

Continued harvest of alligators on refuges may be compensatory to natural losses and can ensure wise use and management of a renewable natural resource. Harvest may also reduce predation impacts on native and migratory animals. By maintaining or reducing the alligator population, biological diversity could be maintained or improved by reducing predation and the public's opportunity to see a greater diversity of species may increase as a result.

Public Safety Issues

Increased alligator numbers in conjunction with increasing public use on the Complex will most likely only increase the number of negative human/alligator encounters. This could lead to increased alligator attacks on humans. Few attacks and no deaths from alligators have been reported in Louisiana. However, Florida reported that since 1970, 177 unprovoked alligator attacks have been documented, of which 99 have been severe and 9 have been fatal (Florida Fish and Wildlife Conservation Commission 2000). Due to these encounters, Florida implemented a nuisance alligator control plan in 1978, but the frequency of attacks has remained stable. Louisiana currently does not have the human population densities of Florida, however, this could change in the future. The nuisance program in Florida has shown some benefits, but attacks continue to occur. By implementing a scientifically managed population-wide alligator harvest, human/alligator encounters may be controlled. Current and future harvest efforts should be in areas most accessible to the visiting public. Alligators also attack and eat domestic livestock and pets, and create traffic hazards when crossing roads. Vehicular and boat collisions with alligators on Sabine National Wildlife Refuge have decreased during the eight years of intensive harvest (Borden-Billiot, pers. comm.)

Socioeconomic importance to Southwestern Louisiana

Alligators have been harvested in Louisiana commercially since the early 1800s (Joanen and McNease, 1987). During the late 1800s through the early 1950s, alligator harvest was uncontrolled for years, and was conducted virtually year-round and advocated by the general public throughout southwestern Louisiana. By the 1950s, alligator harvesting had become a tradition in the local culture and heritage of southwestern Louisiana. Following the closure of the season in 1962, illegal harvest of alligators continued as the hides could be readily sold on the black market for great profits. However, with the implementation of a regulated alligator harvest program, illegal harvest has been substantially lowered. Alligators have proven to be a valuable renewable resource.

While the alligator harvest is conducted for commercial gain, many hunters view the hunt as a recreational and social event each year. Many of the local hunters have limited access for hunting alligators and the national wildlife refuge lands provide a unique opportunity for the general public. Dollars derived from the sale of alligator hides is secondary to the actual harvest experience and subsequent use of meat from the animal. A strictly recreational harvest could be used to harvest alligators but would be administratively and logistically difficult to conduct at current management removal rates. The state alligator harvest program was established as a commercial harvest and does not allow for recreational take of alligators.

Economic importance of the alligator in Louisiana cannot be overlooked. The annual sale of wild alligator hides harvested in Louisiana is in excess of \$3 million dollars and has accounted for sales as high as \$10 million plus. Cameron Parish is the largest (acreage) parish in Louisiana and it contains vast amounts of wetland habitat for which the annual alligator harvest is a very important contributor to the local economy. The 40 percent proceeds collected from each hunter annually by the local

federal refuges has also contributed to the Refuge Revenue Sharing Act fund. This fund is distributed to local counties or parishes in lieu of property taxes.

Harvest of alligators on the federal refuges is well supported in the community and viewed as very beneficial to the public. Reduction or removal of the alligator harvest on the refuges could create public animosity towards the refuges. The three refuges are also some of the only areas within Cameron Parish and southwest Louisiana in which alligator tags are allotted by public lottery rather than by landowner designation.

Conclusion

In the opinion of refuge management, alligator harvest on the Southwest Louisiana National Wildlife Refuge Complex should continue at or above the state-recommended tag allotment rates, unless refuge-specific surveys warrant a deviation below state allotment rates. The benefits of harvesting alligators as a management tool are to: maintain and increase public safety; continue with a viable alligator population; continue biological data collection and monitoring; continue to afford public viewing opportunities; reduce adverse overpopulation effects (e.g., cannibalism and reduced reproduction rates); reduce inter-specific predation, and foster favorable local public and governmental relations.

Mandatory 10-Year Re-evaluation Date: _____

Literature Cited/Consulted

- Borden-Billiot, D.L. 2000. Personal Communication. Sabine National Wildlife Refuge, Hackberry, LA.
- Delany, M. F. 1986. Bird bands recovered from American alligator stomachs in Florida. *North American Bird Bander* 11:92-94.
- _____, and C.L. Abercrombie. 1986. American alligator food habits in north central Florida. *J. Wildl. Manage.* 50(2):348-353.
- Elsy, R.M., T. Joanen, L. McNease, and V. Lance. 1990a. Stress and plasma corti-costerone levels in the American alligator - relationships with stocking density and nesting success. *Comp. Biochem. Physiol.* 95(1):55-63.
- _____, T. Joanen, L. McNease, and V. Lance. 1990b. Growth rate and plasma corti-costerone levels in juvenile alligators maintained at different stocking densities. *The Journal of Experimental Zoology.* 255:30-36.
- _____, T. Joanen, L. McNease, and N. Kinler. 1992a. Growth rates and body condition factors of *Alligator mississippiensis* in coastal Louisiana wetlands: a comparison of wild and farm-released juveniles. *Comp. Biochem. Physiol.* 103(4):667-672.
- _____, V.A. Lance, J. Joanen, and L. McNease. 1991. Acute stress suppresses plasma estradiol levels in female alligators (*Alligator mississippiensis*). *Comp. Biochem. Physiol.* Vol. 100A, No. 3, pp. 649-651.

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- _____, L. McNease, T. Joanen, and N. Kinler. 1992b. Food habits of native wild and farm-released juvenile alligator. Proc. Annual Conf. Southeast. Assoc. Fish and Wildlife Agencies. 46:57-66.
- _____, P.L. Trosclair, and J.T. Linscombe. 2004. The American alligator as a predator of mottled ducks. Southeastern Naturalist 3: 381-390.
- Fogarty, M.J., and J.D. Albury. 1968. Late summer foods of young alligators in Florida. Proc. Ann. Conf. Southeast. Assoc. Game and Fish Comm. 21:220-222.
- Gibbons, J.W. 1990. Life history and ecology of the slider turtle. Smithsonian Institution Press, Washington, D.C. 368 pp.
- Giles, L., and V.L. Childs. 1949. Alligator management on the Sabine National Wildlife Refuge. J. Wildl. Manage. 13(1):16-28.
- Gosselink, J. G., C. L. Cordes, and J. W. Parsons. 1979. An ecological characterization study of the Chenier Plain coastal ecosystem of Louisiana and Texas. U. S. Fish and Wildlife Serv., FWS/OBS-78/9. Washington, D. C. 302pp.
- Greij, E.D. 1994. Common moorhen. Pp. 145-157. In Tacha, T.C., and C.E. Braun, eds. Migratory Shore and Upland Game Bird Management in North America. Allen Press, Lawrence, KS. 223 pp.
- Jacobsen T. and Kushlan. 1989. Growth dynamics in the American alligator (*Alligator mississippiensis*). J. Zool. 219:309-328.
- Joanen and L. McNease. 1970. A telemetric study of nesting female alligators on Rockefeller Refuge, Louisiana. Proc. Annual Conf. Southeast. Assoc. Game and Fish Comm. 24:175-193.
- _____, 1972. A telemetric study of adult male alligators on Rockefeller Refuge, Louisiana. Proc. Annual Conf. Southeast. Assoc. Game and Fish Comm. 26:252-275.
- _____, 1987b. The management of alligators in Louisiana, USA. In Webb, G.J.W., S.C. Manolis, and P.J. Whitehead, eds. Wildlife Management: Crocodiles and Alligators. Surrey Beatty and Sons Pty. Ltd, Australia. pp. 33-42.
- _____, 1987. Alligator farming research in Louisiana, USA. Pages 329-340 in G. W. Webb, S. C. Manolis, and P. J. Whitehead, eds. Wildlife Management: Crocodiles and Alligators. Surrey Beatty and Sons, Chipping Norton, NSW.
- Lance, V.A. and R.M. Elsey. 1986. Stress-induced suppression of testosterone secretion in male alligators. J. of Exp. Zool. 239:241-246.
- Louisiana Department of Wildlife and Fisheries. 1999. Louisiana alligator management program. LA Dept. of Wildl. And Fisheries, Baton Rouge, LA. 15 pp.
- McIlhenny, E.A. 1935. The alligator's life history. The Christopher Publishing House, Boston. 1976 Reprint, SSAR. 117 pp.

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- McNease, L., and T. Joanen. 1974. A study of immature alligators on Rockefeller Refuge, Louisiana. Proc. 28th Ann. Conf. Southeast. Assoc. Game and Fish Comm. 28:482-500.
- _____, and T. Joanen. 1977. Alligator diets in relation to marsh salinity. Proc. Ann. Conf. Southeast. Assoc. Fish and Wildl. Agencies. 31:36-40.
- Nichols, J.D., L. Viehman, R.H. Chabreck, and B. Fenderson. 1976. Simulation of commercially harvested alligator population in Louisiana. Louisiana State University, Bulletin No. 691. 59 pp.
- Nichols, W.L., L. Viehman, R.H. Chabreck and B. Fenderson. 1976. Simulation of a commercially harvested alligator population in Louisiana. Louisiana Agricultural Experimental Station Bulletin 691, Baton Rouge, LA.
- Perry, H.R., Jr. 1982. Muskrats. In Chapman, J.A., and G.A. Feldhamer, eds. Wild Mammals of North America. Johns Hopkins, Baltimore and London. pp 282-325.
- Reid, F.A., M. Meanly, L.H. Fredrickson. 1994. King Rail. pp. 181-191. In Tacha, T.C., and C.E. Braun, eds. Migratory Shore and Upland Game Bird Management in North America. Allen Press, Lawrence, KS. 223 pp.
- Rootes, W.L. 1989. Behavior of the American alligator in a Louisiana freshwater marsh. Ph.D. Dissertation, Louisiana State University, Baton Rouge, LA.
- _____, and R.H. Chabreck. 1993. Cannibalism in the American alligator. Herpetological. 49(1):99-107.
- Sabine National Wildlife Refuge ANR. 1946-1951. Annual Narrative Reports. Sabine National Wildlife Refuge, USFWS, DOI, National Refuge System.
- _____, 1963. Master Plan. Sabine National Wildlife Refuge, USFWS, DOI. 99 pp.
- Shoop, C.R. and C.A. Ruckdeschel. 1990. Alligators as predators on terrestrial mammals. American Midland Naturalist. 124:407-412.
- Stutzenbaker, C.D. 1988. The mottled duck, its life history, ecology and management. Texas Parks and Wildlife Department, Austin, TX. pp. 209.
- Taylor, D., T. Joanen, and L. McNease. 1980. An alligator population model and associated minimum population estimate for non-marsh alligator habitat in Louisiana. Louisiana Dept. of Wildlife and Fisheries, Monroe, LA. 15 pp.
- Valentine, J.M., Jr., J.R. Walther, K.M. McCartney, and L.M. Ivy. 1972. Alligator diets on the Sabine National Wildlife Refuge, Louisiana. J. of Wildl. Manage. 36(3):809-815.
- Webb, G.J.W., R. Buckworth and S.C. Manolis. 1983. *Crocodylus johnstoni* in a controlled-environment chamber: a raising trial. Aust. Wildl. Res. 10:421-432
- Willner, G.R. 1982. Nutria. In Chapman, J.A., and G.A. Feldhamer, eds. Wild Mammals of North America. Johns Hopkins, Baltimore and London. pp. 1059-1076.

Wolfe, J.L., D.K. Bradshaw, and R.H. Chabreck. 1987. Alligator feeding habits: new data and a review. *Northeast Gulf Science*. 9(1):1-8.

Woodward, A.R. and B.L. Cook. 2000. Nuisance-alligator (*Alligator mississippiensis*) control in Florida, U.S.A. Florida Fish and Wildlife Conservation Commission, Gainesville, FL. 12 pp.

Description of Use:

Commercial Video and Photography

Over the past several years, the refuge has been contacted as to the possibility of producing commercial audio-visual productions, such as video and still pictures. The refuge provides an ideal setting for filmmakers. Areas such as the Pintail Wildlife Drive and other refuge locations are adjacent to the Creole Nature Trail, an All American Road and destination for many resident and non-resident visitors. As southwest Louisiana and the Creole Nature Trail, as well as Service programs for visitors are promoted, commercial filming on the area is expected to increase.

Availability of Resources: Adequate refuge personnel and base operational funds are available to manage this activity at the present level.

Anticipated Impacts of Use: Commercially produced video and photography could result in some disturbance to wildlife. Some minimal trampling of vegetation may also occur. However, it is anticipated that this disturbance will be minimal.

Commercially produced video and photography activities are not expected to indirectly, or cumulatively impact refuge resources negatively even though there may be some minimal and direct short-term disturbance or trampling.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Access for commercially produced video and photography activities will be allowed in designated areas only. Activities will be monitored to document any negative impacts to wildlife, if negative impacts are found, corrective action will be taken to reduce or eliminate these impacts. Access to key observation and photography areas may be closed during adverse weather conditions for protection of infrastructure (e.g., roads and levees) and visitor safety.

Public Law Number 106-206 [114 Stat. 314; *cod.* 16 U.S.C. 460I-6d.], signed by the President on May 26, 2000, directed the Secretary of the Interior to require a permit and establish a reasonable fee for commercial filming activities on federal lands administered by the Secretary. This law further stated that for still photography neither a permit nor a fee is assessed if the activities take place on lands where members of the public are generally allowed. The Secretary may require a permit and fee if photographic activities take place at locations where the general public is not allowed or where

additional administrative costs are likely. The Secretary shall not permit any filming, still photography, or other related activity if the Secretary determines 1) there is a likelihood of resource damage; 2) there would be an unreasonable disruption of the public's use and enjoyment of the site; or 3) that the activity poses health or safety risks to the public.

Further guidance is found in Federal Code of Regulations, Title 43, Volume 1, revised October 1, 2004, which regulates the making of pictures, television productions, or sound tracks on certain areas under the jurisdiction of the Department of the Interior. It states that:

- 1) Permits are required of any party except amateur photographers or bona fide newsreel and news television photographers and soundmen. All other parties must obtain written permission from local officials having administrative responsibility for the area involved.
- 2) However, the Secretary has determined that no fee will be charged for the making of such motion pictures, television productions, or sound tracks on areas administered by the Fish and Wildlife Service.
- 3) A bond shall be furnished, or deposit made in cash or by certified check, in an amount to be set by the official in charge of the area to ensure full compliance with all conditions prescribed in a permit. Such bond may be refunded to the applicant if all permit requirements are met and no costs to the Government are incurred.
- 4) Permission to make a motion picture, television production, or sound track will be granted by the head of the Service or his/her authorized representative in his/her discretion and on acceptance by the applicant of conditions set forth in a permit. Applicants must describe the area where filming is requested and the scope of the filming or production or recording. Dependent upon weather conditions, applicants will state when filming or other production will begin and end.

Other stipulations include:

- 1) Utmost care will be exercised to see that no natural features are injured, and after completion of the work, the area will, as required by the official in charge, either be cleaned up and restored to its prior condition or left, after clean-up, in a condition satisfactory to the official in charge.
- 2) Credit will be given to the Department of the Interior and the Service through the use of an appropriate title or announcement, unless there is issued by the official in charge of the area a written statement that no such courtesy credit is desired. A copy of the final product will be provided pro bono to the refuge staff.
- 3) Pictures will be taken of wildlife only when such wildlife will be shown in its natural state or under approved management conditions if such wildlife is confined.
- 4) Any special instructions received from the official in charge of the area will be complied with.
- 5) Any additional information relating to the privilege applied for by the applicant will be furnished upon request of the official in charge.
- 6) Other stipulations may be warranted depending upon the proposed location and season of the year the activity is conducted.

Further guidance on this activity is found in the Service's Refuge Manual [8 RM 16, dated March 12, 1982].

The following stipulations apply to special use permits issued for commercially produced video and photography activities. To minimize impacts on refuge lands and resources, the refuge manager will ensure that filmmakers comply with policies, rules and regulations and will monitor and assess all activities of filmmakers.

Failure to abide by any part of a special use permit: violation of any refuge related provision in Titles 43 or 50, Code of Federal Regulations; or any pertinent state regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of the permit and could result in denial of future permit requests for lands administered by the Fish and Wildlife Service. This provision applies to all persons working under the authority of this permit.

The permittee is responsible for ensuring that all employees, party members, and any other persons working for the permittee and conducting activities allowed by the permit are familiar with and adhere to the conditions of the permit.

The permit may be canceled or revised at any time by the refuge manager for noncompliance or in case of emergency (e.g., public safety and unusual resource problems).

The permittee and permittee's clients do not have exclusive use of this site(s) or lands covered by the permit.

Prior to beginning any activities allowed by this permit, the permittees shall provide the refuge with (1) a copy of current business license; and (2) proof of comprehensive general liability insurance.

Prior to conducting commercial filming activities, the permittee shall provide the refuge manager with the name and method of contact for the field party chief or supervisor.

A valid copy of the special use permit, signed by the refuge manager or designee, must be in the party leader's possession at all times while exercising the privileges of the permit.

Endorsement of the permit signifies the permittee's understanding and concurrence with all the conditions set forth in the General Conditions found on the reverse side of the permit and the above Special Conditions.

Under stipulations described above, commercially produced filmmaking, production, or sound track recording are viewed as compatible with the purpose for which the refuge was established.

Justification: Allowing commercially guided wildlife viewing, photography, and environmental education, and interpretation are economic uses that must contribute to the achievement of the refuge purpose or the mission of the refuge. Individuals or companies serving as guides for these types of uses would lead groups of people that may not normally visit the refuge, such as the elderly, handicapped, or urban youth groups. The services provided by commercial guides will be beneficial to extend public appreciation and understanding of wildlife, natural habitats, and the mission of the National Wildlife Refuge System.

Commercial guiding will be incidental to four (e.g., wildlife observation, wildlife photography, and environmental education and interpretation) of the six priority public uses on national wildlife refuges. Conditions imposed in the special use permits of guides will ensure that these wildlife-dependent activities occur without adverse effects to refuge resources or other visitors. Permitted guides facilitate public use and enjoyment of these activities while protecting refuge resources.

Commercial photography will be regulated and monitored with special use permits. The refuge will ensure this activity has a primary focus on education and information on refuge purposes and/or the Refuge System mission.

Conditions imposed in the special use permits of filmmakers ensure that these wildlife-dependent activities can occur without adverse effects to refuge resources or other visitors.

Mandatory 10-Year Re-evaluation Date: _____

Description of Use:

Commercially Guided Wildlife Viewing, Photography, and Environmental Education and Interpretation

Over the past several years, the refuge has been contacted as to the possibility of guide/outfitter wildlife viewing opportunities. All requests have pertained to conducting van/bus tours for various sized groups around the wildlife drive for wildlife viewing opportunities. Presently there are no known guide operations utilizing the refuge. The primary wildlife viewing opportunity on the refuge is the Lacassine Pool Wildlife Drive, which is a destination for many resident and non-resident visitors. As tourism in southwest Louisiana is promoted, visitor use of the refuge is expected to increase. With the number of visitors increasing, a shift in types of recreation use and users may occur. It is anticipated that wildlife viewing on Lacassine Refuge will increase as a proportion of total recreation use days.

Availability of Resources: Adequate refuge personnel and base operational funds are available to manage wildlife-dependent recreational activities at present levels.

Anticipated Impacts of Use: Commercially guided wildlife viewing, photography, and environmental education and interpretation could result in some disturbance to wildlife adjacent to the wildlife drive, especially if visitors exit their vehicles. It is anticipated that this disturbance to wildlife will be minimal because of van traffic but some additional disturbance may occur with larger tour buses. Vehicle size has been shown to cause some temporary displacement of birds. Often wildlife will relocate to interior sections of the wildlife drive after being disturbed. Allowing larger vehicles to accommodate more people could result in an increased public awareness of the refuge and its wildlife and an enhanced appreciation for the National Wildlife Refuge System. Boardwalks, auto-tour routes, photo blinds, and observation platforms will be designed and placed to minimize disturbance potential.

Wildlife viewing and photography are not expected to indirectly or cumulatively impact refuge resources negatively even though there may be some minimal and direct short-term disturbance to wildlife or vegetation.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Access for commercially guided wildlife viewing, photography, and environmental education and interpretation will be allowed in designated areas only. Bus riders will not be permitted to depart the bus except in specially designated areas. Activities will be monitored to document any negative impacts to wildlife, if negative impacts are found, corrective action will be taken to reduce or eliminate these impacts. Access to key observation

and photography areas may be closed during adverse weather conditions for protection of infrastructure (e.g., roads and levees) and visitor safety.

The following stipulations apply to special use permits issued for wildlife-dependent recreation (e.g., wildlife viewing, wildlife photography, and environmental education and interpretation). To minimize impacts on refuge lands and resources, law enforcement patrols will routinely be conducted in an effort to maximize compliance with policies, rules, and regulations. This will ensure that activities will be monitored and assessed.

- Failure to abide by any part of this special use permit: violation of any refuge related provision in Titles 43 or 50, Code of Federal Regulations; or any pertinent state regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the Fish and Wildlife Service. This provision applies to all persons working under the authority of this permit.
- The permittee is responsible for ensuring that all employees, party members, and any other persons working for the permittee and conducting activities allowed by this permit are familiar with and adhere to the conditions of this permit.
- This permit may be canceled or revised at any time by the refuge manager for noncompliance or in case of emergency (e.g., public safety and unusual resource problems).
- The permittee and permittee's clients do not have exclusive use of this site(s) or lands covered by the permit.
- Prior to beginning any activities allowed by this permit, the permittees shall provide the refuge with (1) a copy of current business license; (2) proof of comprehensive general liability insurance.
- The permittee is responsible for accurate record keeping and shall provide the refuge manager with a comprehensive summary of location, numbers of clients, and number of client days by January 15 each year. The permittee shall provide the refuge manager with this information on the form provided with the special use permit. An annual nonrefundable administrative fee of \$150 will be assessed prior to issuing this permit. Failure to submit required reports could result in the issuance of citations and revocation of the permit.
- Prior to conducting guiding operations, the permittee shall provide the refuge manager with the name and method of contact for the field party chief or supervisor.
- A valid copy of this special use permit, signed by the refuge manager or designee, must be in the party leader's possession at all times while exercising the privileges of the permit.
- Endorsement of this permit signifies the permittee's understanding and concurrence with all the conditions set forth in the General Conditions found on the reverse side of the permit and the above Special Conditions.

Given limited access, commercially guided wildlife viewing, wildlife photography, and environmental education and interpretation are viewed as compatible with the purpose for which the refuge was established.

Justification: Allowing commercial video and photography are economic uses that must contribute to the achievement of the refuge purpose or the mission of the refuge. The products may reach groups of people that may not normally know about the refuge, such as the elderly, handicapped, or urban youth groups. The services provided by commercial filmmakers will be beneficial to extend public appreciation and understanding of wildlife, natural habitats, and the mission of the National Wildlife Refuge System.

Conditions imposed in the special use permits of commercial filmmakers will ensure that these wildlife-dependent activities occur without adverse effects to refuge resources or other visitors.

Commercial photography will be regulated and monitored with special use permits. The refuge will ensure this activity has a primary focus on education and information on refuge purposes and/or the Refuge System mission.

Conditions imposed in the special use permits of filmmakers ensure that these wildlife-dependent activities can occur without adverse effects to refuge resources or other visitors.

Mandatory 10-Year Re-Evaluation Date: _____

Description of Use:

Cooperative Farming

Cooperative farming on two units (B and F) within the refuge is directly related to the management of waterfowl, specifically pintails. Pintails using the Lacassine Pool typically depart for nocturnal foraging areas within surrounding agricultural habitats; these birds can expend approximately 7-19 percent of their caloric intake on this round-trip flight (Cox and Afton 1996). Provision of foraging habitat in the nearby proximity to the pool is extremely valuable for decreasing waterfowl flight times and their associated energetic expenditures. Maximizing waterfowl food production in the farm units of the refuge contributes to this habitat need. Although moist-soil management for annual plants will provide the greatest benefit to waterfowl, cooperative farming produces substantial food resources for waterfowl but at no cost to the refuge. Additionally, cooperative farming ensures that habitat succession remains at levels that benefit many migratory birds.

Availability of Resources: Resources are adequate for this use.

Anticipated Impacts of Use: The incidental disturbance of wildlife species may occur during cooperative farming activities. Cooperative farming may result in some additional wildlife disturbance and temporary displacement of wildlife.

Cooperative farming does not negatively impact the refuge and provides waterfowl an available food source and rest area. This use is not expected to indirectly or cumulatively impact refuge resources although some incidental and short-term disturbance may occur.

Public Review and Comment: This compatibility determination is made available for public comment in conjunction with the public comment period for the Lacassine National Wildlife Refuge Draft Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with the following Stipulations

Stipulations Necessary to Ensure Compatibility: Issuance of cooperative farming agreement is required for all cooperative farming activities conducted on the refuge. Activities authorized by the agreements are restricted to the dates and locations designated and other conditions identified in the agreements.

Crops grown on the refuge will include only those species which provide seed and/or browse suitable for wildlife consumption, or the cooperative farmer will plant a crop for wildlife consumption after the harvest of the commercial crop, as specified in the cooperative farming agreement. All crops, including crops planted specifically as wildlife food, will be approved by the refuge manager and identified in the cooperative farming agreement.

Pesticide Use Proposals will be submitted annually to the refuge manager and routed through the appropriate Fish and Wildlife Service channels for approval prior to use on the refuge. All pesticides applied on the refuge must be approved by the appropriate Fish and Wildlife Service office. All other soil additives and amendments will be approved by the refuge manager prior to application.

Justification: Units managed through cooperative farming programs provide foraging opportunities for wintering waterfowl and shorebirds. By leaving the second rice crop in the field, the refuge provides a dependable food resource for waterfowl. Flooded fallow cropland also provides a very important habitat for migrating shorebirds during the months of August and September.

Mandatory 10-Year Re-evaluation Date: _____

Approval of Compatibility Determination

The signature of approval is for all compatibility determinations considered within the Comprehensive Conservation Plan for Lacassine National Wildlife Refuge. If one of the descriptive uses is considered for compatibility outside of the plan, the signature becomes part of that determination.

Refuge Manager:

(Signature/Date)

Complex Manager:

(Signature/Date)

**Regional Compatibility
Coordinator:**

(Signature/Date)

Refuge Supervisor:

(Signature/Date)

**Regional Chief, National
Wildlife Refuge System,
Southeast Region:**

(Signature/Date)

Appendix G - Refuge Operating Needs and Service Asset Maintenance Management System Needs

Projects within the Refuge Operation Needs Database

RONS	Title	One-time Costs
Project 1. Improve freshwater impounded marsh		
00004	Improve Sport Fish and Aquatic Resources	\$134,000
99011	Lacassine Pool Impoundment Research	\$ 70,000
Project 2.. Improve early successional wetlands		
03006	Moist Soil Management/Farming Implements	\$ 77,000
00005	Decrease Erosion and Protect Important Wetlands	\$150,000
01001	Improve Moist Soil Management at Unit A	\$ 89,000
03002	Equipment/Implement Storage Shed	\$135,000
04001	Equipment/Backhoe Front End Loader	\$125,000
04002	Chain Link Fence around Maintenance Facility	\$ 39,000
97002	Improve the Farming for Wildlife Program	\$150,000
97013	Improve Refuge Farming Program	\$135,000
97032	Enhance Farming for Wildlife Program	\$121,000
99008	Enhancement of Wading Bird Nesting Habitat	\$121,000
Project 3. Improve unimpounded freshwater marsh		
00003	Restoration of Abandoned Oil & Gas Production Areas	\$ 86,000
03005	Lacassine Bayou North Washout Area Restoration	\$400,000
97037	Decrease Erosion and Protect Important Wetlands	\$150,000
Project 4. Restore special habitats		
00002	Prepare a Prairie Restoration Handbook	\$ 25,000
99004	Coastal Prairie Restoration Biologist	\$147,000
99014	Prairie Restoration Enhancement	\$ 40,000
Project 5. Control invasive species		
00001	Control Invasive Exotic Species	\$150,000
Project 6. Inventory and monitor		
97036	Develop Oil & Gas Monitoring Program (Biology CCP)	\$134,000

RONS	Title	One-time Costs
97040	Expand Refuge Biological Monitoring Programs	\$ 75,000
97042	Enhance Refuge Management Capabilities Using GIS	\$ 30,000
Project 7. Improve visitor services		
03003	Gravel Roads (Public Access/parking Improvements)	\$ 60,000
03004	Radio Equipment Additions	\$ 45,000
97014	Improve Public Access	\$140,000
97034	Improved Visitor Use Facilities	\$ 46,000
98003	Improve EE/Outreach/Public Use Opportunities	\$ 75,000
Project 8. Promote priority public uses		
03001	Refuge Law Enforcement/Safety Capabilities	\$ 85,000
97007	Provide Necessary Law Enforcement Equipment	\$ 30,000
97026	Improve Refuge Law Enforcement Patrol Capabilities	\$ 40,000
99006	Establish Cooperative Education Manager Trainee FTE	\$114,000

Projects identified within the Service Asset Maintenance Management System Database

SAMMS Work Order #	Old MMS #	Project Type	Cost
Project 1. Improve freshwater impounded marsh			
		Replace southwest spillway of Lacassine Pool	
93101980	93085	Pool	\$493,000
96101989	96131	Replace southeast spillway at Lacassine Pool	\$383,000
98102028	98015	Repair deficient East Pool Levee Road	\$386,000
98102029	98016	Repair deficient West Pool Levee Road	\$270,000
98102030	98017	Repair deficient northeast pool levee road	\$308,000
98102032	98026	Rehabilitate northwest pool levee road	\$348,000
98102036	98034	Replace worn pump shed at Unit D	\$36,000
Project 2. Improve early successional wetlands			
		Rehabilitate Unit A Pumping Station (Pump & Engine)	
3125675	3013	Engine)	\$73,000
96101993	96143	Repair Unit A pump shed and fuel tank	\$26,000
97102013	97031	Rehabilitate 2.25 miles of Unit B roads	\$71,000
3. Improve unimpounded freshwater marsh			

SAMMS Work Order #	Old MMS #	Project Type	Cost
		Rehabilitate 3 miles of deficient Coto Plot roads	
97102012	97030		\$93,000
Project 7. Improve visitor services			
98102031	4006	CN Refuge Headquarters Entrance Road (Rte 10; 0.4 mi)	\$118,000
4136178	4006	Rehabilitate Headquarters Front Parking (Route900)	\$25,000
3125682	3015	Replace Kiosks for Headquarters and Streeter Road Visitors	\$35,000
96101987	96126	Replace refuge boundary signs	\$26,000
3125713	3021	Remove Concrete Wharf (unserviceable boat dock)	\$80,000
1112744	1001(0)	Replace non-compliant radio system to meet Federal standard and enhance safety.	\$68,000
3125716	3022	Replace Interpretive/Directional Signs	\$31,000
98102033	4006	Rehabilitate deficient wildlife drive	\$522,000
Project 8. Promote priority public uses			
4130579	4007	Replace Headquarters Display Pond Boardwalk/Deck	\$26,000
96101990	4006	Rehabilitate deteriorated Unit A roads	\$54,000
96101991	4006	Renovate deficient Unit D parking area	\$11,000
98102019	4006	Repair deficient P&H fishing pier parking lot	\$49,000
98102025	4006	Rehabilitate deficient Pool Kiosk gravel parking lot	\$22,000
98102026	4006	CN Unit A parking lot (Rte ??)	\$72,000
98102027	4006	Rehabilitate the deficient parking lot at the west boat launch	\$90,000
98102034	4006	Rehabilitate deficient Unit B observation tower parking lot	\$35,000
98102035	4006	Rehabilitate deteriorated Streeter Road	\$81,000
98102037	4006	Rehabilitate parking area at Tidewater boat launch	\$77,000
3126121	4006	Rehabilitate Unit A North Road (widen for Safety/Staff & Public Access)	\$230,000
4135720	4006	Rehabilitate deficient Unit D Observation Tower Parking (Route906)	\$25,000
4136156	4006	Rehabilitate Lacassine Pool Entrance Road (Route103)	\$100,000
4136183	4006	Pool Main Kiosk Parking Area (Route 902)	\$25,000
4136192	4006	Rehabilitate Streeter Road (Route102)	\$200,000

SAMMS Work Order #	Old MMS #	Project Type	Cost
Miscellaneous			
3125721	3024	Remodel Quarters #1 Residence	\$13,000
1113394	1007	Replace portable chemical storage building	\$26,000
93101982	93088	Replace Tidewater bridge	\$378,000
3125723	3026	Remove Quarters #1 Boathouse (Demolition)	\$11,000
98102023	98010	Replace metal building	\$36,000
4136508	4407	Repair Multiple Bridges	\$34,000
Equipment			
97101997	97004	Replace 1979 dragline w/Excavator	\$325,000
97102014	97032	Replace 28-hp tractor.	\$0
97102009	97020	Replace 1979 Caterpillar D5B Bulldozer	\$164,000
97101996	97002	Replace 1963 International Disk Harrow	\$27,000
3125632	3008	Replace 1976 GMC Winch Truck	\$52,000
97102007	97017a	Replace 1980 road grader	\$164,000
97102001	97008	Replace 1979 Ford TW20 Tractor	\$90,000
97102008	97019	Replace 1986 John Deere Dozer	\$71,000
97102006	97015	Replace 1991 4x4 Honda ATV & Trailer	\$25,000
1113922	1010	Replace amphibious excavator	\$316,000
1114034	1016	Replace 1999 Navistar diesel truck	\$64,000
97102010	97021	Replace dump truck	\$86,000
4134766	4001	Replace 2145 4WD Buhler Tractor	\$80,000
97102005	4006	Replace John Deere disk harrow	\$27,000
97101995	4006	Replace 1987 Stossel Airboat	\$38,000
3125705	4006	Replace Konica Copy Machine, Fax Machine, and Phone System	\$28,000
3125569	4006	Replace Deck Mowers (Bush Hogs)	\$37,000
1112870	4006	Replace custom-made mud boat	\$25,000
3125657	4006	Replace Pettibone Forklift, 10,000 # capacity (Model A-3520-1)	\$57,000
3125554	4006	Replace Landscape Management Equipment	\$25,000
1112803	4006	Replace 1994 Stossel airboat (Tan)	\$37,000
3125703	4006	Replace Airboat Polymer Bottom-Coating	\$22,000
3125718	4006	Replace Wooden Mats for Dragline Operational Safety	\$25,000
3125824	4006	Replace Quachita 14' Aluminum Boat w/30 hp Johnson Outboard	\$25,000
97102016	4006	Replace flat bottom boat & trailer	\$25,000
3125707	4006	Replace 2001 Chevrolet 4X4 Pickup (Law Enforcement)	\$35,000
1113972	4006	Replace 1996 Ford Bronco	\$31,000
1113983	4006	Replace 1997 Ford Ranger truck	\$26,000

SAMMS Work Order #	Old MMS #	Project Type	Cost
1114049	4006	Replace 1998 Ford Club Wagon Van	\$22,000
1113910	4006	Replace Marsh Master Buggy and Trailer	\$75,000
3125825	4006	Replace Water Buffalo used to Manage Aquatic Vegetation	\$25,000
1113389	4006	Replace Kline airboat (Red)	\$37,000
3125678	4006	Replace Travel Trailers (FEMA; 4)	\$48,000
1113980	4006	Replace 1998 Chevrolet S-10 truck	\$26,000
3125655	4006	Replace Speeco Blade/Grader, Rear Mounted, 6'	\$47,000
1114040	4006	Replace 2000 Ford Explorer	\$24,000
3125596	4006	Replace 2002 Dodge Durango	\$37,000
3125595	4006	Replace 2003 Chevrolet 4X2 Pickup	\$33,000
3125594	4006	Replace 2003 Dodge 2500 4X2 Diesel Pickup	\$37,000
4134786	4006	Replace 2003 4X4 Honda ATV and Trailer	\$8,000
4134819	4006	Replace worn riding lawn mower	\$12,000
97102015	4006	Replace 1940 Monark boat & 1977 Highlander trailer	\$10,000
1113912	4006	Replace Trailer for Marsh Master Buggy	\$8,000
1113937	4006	Replace trailer-mounted fire-fighting unit	\$11,000
3125593	4006	Replace 1992 4X2 Chevrolet Pickup Truck	\$33,000
3125638	4006	Replace 1992 Jeep Cherokee 4X4	\$31,000
3125826	3029	Replace Frankfurt Levee Bridge	\$574,000
4134817	4004	Rehab Refuge Office Facility	\$25,000
Roads			
98102024	4006	Repair deficient Terrace Road	\$325,000
98110067	4006	Rehabilitate deteriorating Tidewater Road	\$584,000
2122121	4006b	CN/CE 6 roads (Rte 10, 11, 100-103; 8.25 mi)	\$1,634,000
2122125	4006a	PE 6 roads (Rte 10, 11, 100-103; 8.25 mi)	\$106,000

RONs	Title	One-time Costs
Project 8. Promote priority public uses		
99006	Establish Cooperative Education Manager Trainee FTE	\$114,000