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**DRAFT COMPREHENSIVE CONSERVATION PLAN  
AND ENVIRONMENTAL ASSESSMENT**

**CATAHOULA NATIONAL WILDLIFE REFUGE**  
*LASALLE AND CATAHOULA PARISHES, LOUISIANA*

**U.S. Department of the Interior  
Fish and Wildlife Service**

*Southeast Region  
Atlanta, Georgia*

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## SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

### *I. Background*

This Draft Comprehensive Conservation Plan and Environmental Assessment for Catahoula National Wildlife Refuge was prepared to guide management actions and direction for the refuge. 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.

A planning team developed a range of alternatives that best met the goals and objectives of the refuge and that could be implemented within the 15-year planning period. This draft comprehensive conservation plan and environmental assessment describes the Fish and Wildlife Service's proposed plan, as well as other alternatives considered and their effects on the environment. This draft plan and environmental assessment will be made available to state and federal government agencies, conservation partners, and the general public for review and comment. Comments from each entity will be considered in the development of the final plan.

The purpose of the plan is to develop a proposed action that best achieves the refuge purpose; attains the vision and goals developed for the refuge; contributes to National Wildlife Refuge System mission; addresses key problems, issues, and relevant mandates; and is consistent with sound principles of fish and wildlife management.

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/education programs, are consistent with the mandates of the National Wildlife Refuge System; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

Perhaps the greatest need of the Service is communication with the public and the public's participation in carrying out the mission of the National Wildlife Refuge System. Many agencies, organizations, institutions, and businesses have developed relationships with the Service to advance the mission of national wildlife refuges.

#### **FISH AND WILDLIFE SERVICE**

As part of its mission, the Service manages more than 540 national wildlife refuges covering over 95 million acres. These areas comprise the National Wildlife Refuge System, the world's largest collection of lands set aside specifically for fish and wildlife. The majority of these lands, 77 million acres, is in Alaska. The remaining acres are spread across the other 49 states and several United States territories. In addition to refuges, the Service manages thousands of small wetlands, national fish hatcheries, 64 fishery resource offices, and 78 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, and helps

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foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

## **NATIONAL WILDLIFE REFUGE SYSTEM**

The mission of the National Wildlife Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997 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 National Wildlife Refuge System Improvement Act of 1997 established, for the first time, a clear legislative mission of wildlife conservation for the National Wildlife Refuge System. Actions were initiated in 1997 to comply with the direction of this new legislation, including an effort to complete comprehensive conservation plans for all refuges. These plans, which are completed with full public involvement, help guide the future management of refuges by establishing natural resources and recreation/education programs. Consistent with this Act, approved plans will serve as the guidelines for refuge management for the next 15 years. The Act states that each refuge shall be managed to:

- Fulfill the mission of the National Wildlife Refuge System;
- Fulfill the individual purposes 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; and
- 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.

Approximately 38 million people visited National Wildlife Refuges in 2002, most to observe wildlife in their natural habitats. As the number of visitors grows, there are significant economic benefits to local communities. In 2001, 82 million people, 16 years and older, fished, hunted, or observed wildlife, generating \$108 billion. In a study completed in 2002 on 15 refuges, visitation had grown 36 percent in 7 years. At the same time, the number of jobs generated in surrounding communities grew to 120 per refuge, up from 87 jobs in 1995, pouring more than \$2.2 million into local economies. The 15 refuges in the 1995 study were Chincoteague (Virginia); National Elk (Wyoming); Crab Orchard (Illinois); Eufaula (Alabama); Charles M. Russell (Montana); Umatilla (Oregon); Quivira (Kansas); Mattamuskeet (North Carolina); Upper Souris (North Dakota); San Francisco Bay (California); Laguna Atacosa (Texas); Horicon (Wisconsin); Las Vegas (Nevada); Tule Lake (California); and Tensas River (Louisiana). Other findings also validate the belief that communities near refuges benefit economically. Expenditures on food, lodging, and transportation grew to \$6.8 million per refuge, up 31 percent from \$5.2 million in 1995. For each federal dollar spent on the Refuge System, surrounding communities benefited with \$4.43 in recreation expenditures and \$1.42 in job-related income.

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Volunteers continue to be a major contributor to the success of the Refuge System. In 2002, volunteers contributed more than 1.5 million hours on refuges nationwide, a service valued at more than \$22 million.

The wildlife and habitat vision for national wildlife refuges stresses that wildlife comes first; that ecosystems, biodiversity, and wilderness are vital concepts in refuge management; that refuges must be healthy and growth must be strategic; and that the refuge system serves as a model for habitat management with broad participation from others.

## **LEGAL POLICY CONTEXT**

Administration of national wildlife refuges is guided by the mission and goals of the National Wildlife Refuge System, congressional legislation, Presidential Executive Orders, and international treaties. 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 III for a complete listing of relevant legal mandates.

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 as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public (these uses include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation); and
- Ensure that visitor activities are compatible with refuge purposes.

## **NATIONAL AND INTERNATIONAL CONSERVATION PLANS AND INITIATIVES**

Multiple partnerships have been developed among government and private entities to address the environmental problems effecting regions. There is a large amount of conservation and protection information that defines the role of the refuge at the local, national, international, and ecosystem levels. Conservation initiatives include broad-scale planning and cooperation between affected parties to address declining trends of natural, physical, social, and economic environments. The conservation guidance described below, along with issues, problems and trends, was reviewed and integrated where appropriate into this Draft Comprehensive Conservation Plan.

Perhaps the greatest need of the Service is communication with the public and public agency participation in efforts to carry out the mission of the National Wildlife Refuge System. Many agencies, organizations, institutions, and businesses have developed relationships with the Service to advance the mission of national wildlife refuges. This Draft Comprehensive Conservation Plan supports, among others, the North American Bird Conservation Initiative, the North American Waterfowl Management Plan, the Partners-in-Flight Plan, the Western Hemisphere Shorebird Reserve Network, the North American Waterbird Plan, and the U.S. Woodcock Plan.

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## *NORTH AMERICAN BIRD CONSERVATION INITIATIVE*

The North American Bird Conservation Initiative is a coalition of government, private and academic organizations, and private industry leaders addressing bird conservation. The initiative's vision is to achieve regionally based, biologically driven, landscape-oriented partnerships that deliver the full spectrum of bird conservation across the North American continent and that support simultaneous, on-the-ground delivery of conservation for all birds. As a result, North American bird populations will flourish, because they are valued by society, including all levels of government and private initiative.

## *NORTH AMERICAN WATERFOWL MANAGEMENT PLAN*

The North American Waterfowl Management Plan is an international action plan to conserve migratory birds throughout the continent. Its goal is to return waterfowl populations to their 1970s levels by conserving wetland and upland habitat. Canada and the United States signed the Plan in 1986 in reaction to critically low numbers of waterfowl. Mexico joined in 1994, making it a truly continental effort. The plan is a partnership of federal, provincial/state and municipal governments, non-governmental organizations, private companies, and many individuals, all working towards achieving better wetland habitat for the benefit of migratory birds, other wetland-associated species, and people.

## *PARTNERS-IN-FLIGHT BIRD CONSERVATION PLAN*

The Partners-in-Flight Bird Conservation Plan was launched in 1990 in response to growing concerns about many land bird species. It is a cooperative effort involving partnerships among federal, state, and local governments, philanthropic foundations, conservation organizations, professional organization, industry, the academic community, and private individuals. The central premise of Partners-in-Flight has been that resources of public and private organizations in North and South America must be combined, coordinated, and increased in order to achieve success in conserving land bird populations in this Hemisphere.

## *U.S. SHOREBIRD CONSERVATION PLAN*

The U.S. Shorebird Conservation Plan is a partnership effort throughout the United States to ensure that stable and self-sustaining populations of shorebird species are restored and protected. The plan was developed by a wide range of agencies, organizations, and shorebird experts for separate regions of the country, and identifies conservation goals, critical habitat conservation needs, key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face.

## *NORTHERN AMERICAN WATERBIRD CONSERVATION PLAN*

This plan provides a framework for the conservation and management of 210 species of waterbirds in 29 nations. Threats to waterbird populations include destruction of inland and coastal wetlands, introduced predators and invasive species, pollutants, mortality from fisheries and industries, disturbance, and conflicts arising from abundant species. Particularly important habitats of the Service's Southeast Region include pelagic areas, marshes, forested wetlands, and barrier and sea island complexes. Fifteen species of waterbirds are federally listed, including breeding populations of wood storks, Mississippi sandhill cranes, whooping cranes, interior least terns, and Gulf Coast populations of brown pelicans. A key objective of this plan is the standardization of data collection efforts to better recommend effective conservation measures.

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## *U.S. WOODCOCK PLAN*

The U.S. Woodcock Plan was written by the Service in 1990 to “guide the conservation of woodcock in the United States.” Although no step-down plans have been written, the plan gives general guidance for habitat population management at the national level.

## **RELATIONSHIP TO STATE WILDLIFE AGENCY**

A provision of the National Wildlife Refuge System Improvement Act of 1997, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with other state fish and game agencies and tribal governments during the course of acquiring and managing refuges. State wildlife management areas and wildlife refuges provide the foundation for the protection of species, and contribute to the overall health and sustainment of fish and wildlife species in the State of Louisiana.

The Louisiana Department of Wildlife and Fisheries (LDWF) is a state partnering agency with the Service and is charged with the responsibility of managing and protecting Louisiana's abundant natural resources (LDWF, No date). This includes enforcement responsibilities for migratory birds and endangered species, as well as managing the state's natural resources and approximately 1.4 million acres of coastal marshes and wildlife management areas. LDWF coordinates the state wildlife conservation program and provides public recreation opportunities, including an extensive hunting and fishing program on 47 state wildlife management areas totaling 910,352 acres. It also manages nine refuges, totaling 540,694 acres, which are not hunted, and is responsible for fisheries in 1.7 million acres of lakes and 50,145 miles of streams (Moreland, 2005; Tilyou, 2005).

Near the refuge, LDWF coordinates the state's wildlife conservation program and provides public recreation opportunities, including an extensive hunting and fishing program, on the Dewey Willis Wildlife Management Area, a 60,276-acre area that borders the south side of the headquarters unit of the refuge. In addition, it manages the natural resources on Catahoula Lake, which is adjacent to nine miles of the refuge headquarters unit.

The state's participation and contribution throughout this planning process will provide for ongoing opportunities and open dialogue to improve the ecological sustainment of fish and wildlife in Louisiana. An essential part of comprehensive conservation planning is integrating common mission objectives where appropriate.



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## *II. Refuge Overview*

### **INTRODUCTION**

Catahoula National Wildlife Refuge was established in 1958 primarily as a wintering area for migratory waterfowl. The refuge, in east-central LaSalle Parish and west-central Catahoula Parish, Louisiana, about 30 miles northeast of Alexandria, and 12 miles east of Jena, now totals 25,242 acres (Figure 1). An additional 3,012 acres of land are included in the approved acquisition boundary of the refuge. The 6,671-acre Headquarters Unit borders nine miles of the northeast shore of Catahoula Lake, a 26,000-acre natural wetland renowned for its large concentrations of migratory waterfowl. The 18,571-acre Bushley Bayou Unit, located eight miles west of Jonesville, was established in May 2001. The acquisition was made possible through a partnership agreement between The Conservation Fund, American Electric Power, and the Fish and Wildlife Service (Figure 2).

The refuge lies within a physiographic region known as the Mississippi Alluvial Valley. This valley was, at one time, a 25-million-acre forested wetland complex that extended along both sides of the Mississippi River from Illinois through Louisiana. Although the refuge was part of this very productive bottomland hardwood ecosystem, most of the forest on the refuge was cleared in the early 1970s for agriculture production.

Currently, the refuge provides a mix of various habitat types, including remnant pieces of bottomland hardwood forest, reforested areas, cypress sloughs, moist-soil areas, grassland habitat, and mudflats. Since the inception of the refuge, approximately 13,868 acres have been reforested or are reverting naturally to a bottomland hardwood community. Primary species planted in the reforested areas are: (1) willow oak; (2) green ash; (3) baldcypress; (4) overcup oak; and (5) Nuttall oak.

The diverse habitats found on the refuge are home to numerous wildlife species. Migratory birds such as waterfowl, shorebirds, and neotropical migratory birds use the refuge during certain times of the year, but there are also resident birds, such as the northern cardinal and wood duck that are here all year. Other species of resident wildlife that occur include white-tailed deer, cottontail rabbit, river otter, red-eared slider, and tree frog. Fish species include catfish, buffalo, garfish, largemouth bass, and crappie.

### **REFUGE HISTORY AND PURPOSE**

The refuge was established in 1958 under the authority of the Migratory Bird Conservation Act, which calls for:

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

and the Fish and Wildlife Act of 1956, which calls for:

"... the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f (a) (4) "...the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. § 742f (b) (1) (Fish and Wildlife Act of 1956).

Figure 1: The Location of Catahoula National Wildlife Refuge

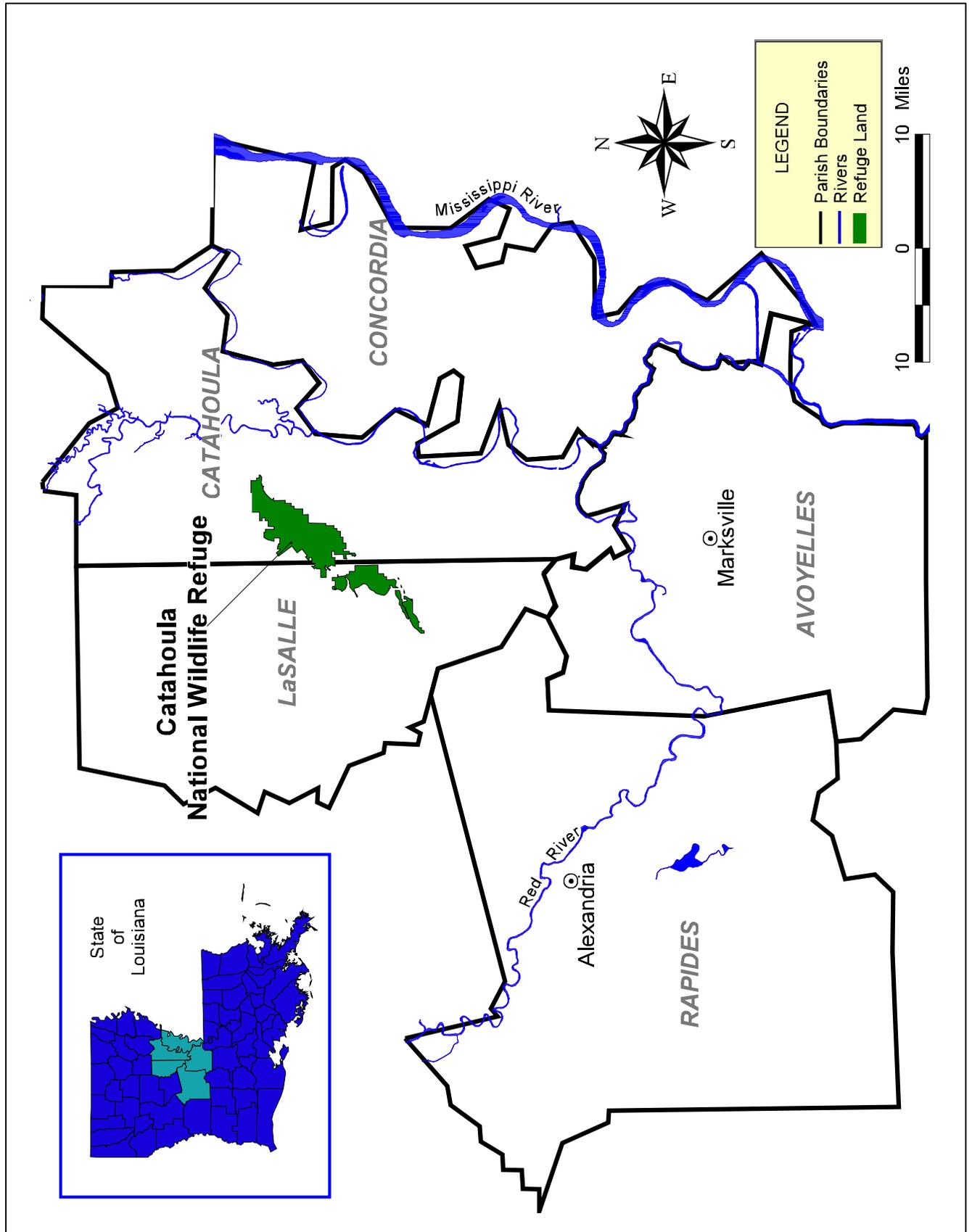
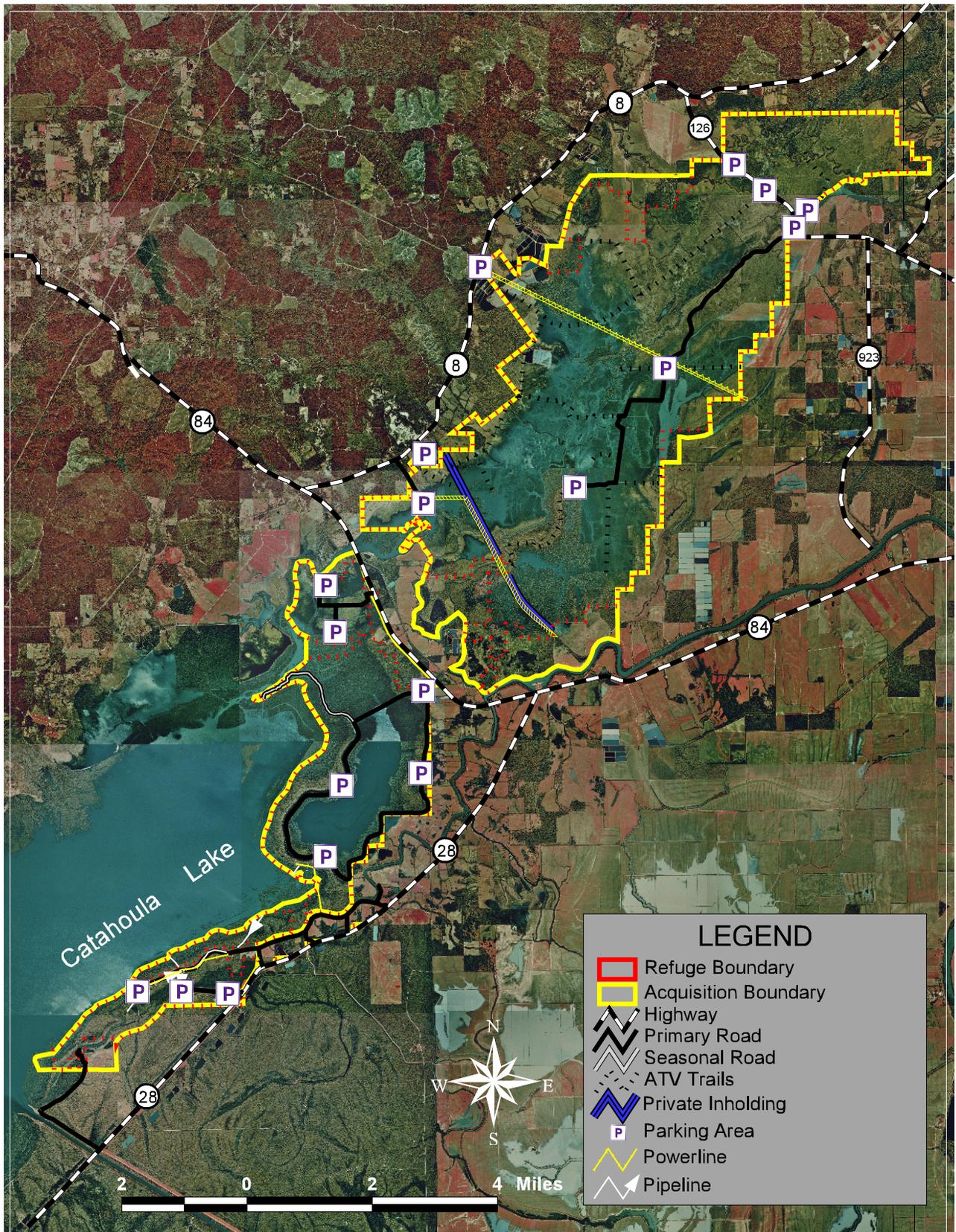


Figure 2: Approved acquisition boundary for Catahoula National Wildlife Refuge



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With these establishing authorities, objectives for Headquarters Unit of Catahoula Refuge were refined as the following:

- To provide migrating and wintering habitat for migratory waterfowl consistent with the overall objectives of the Mississippi Flyway;
- To provide habitat and protection for threatened and endangered species;
- To manage bottomland hardwoods and provide habitat for a natural wildlife diversity;
- To provide opportunities for wildlife-dependent recreation, interpretation, and environmental education for 160,000 visitors annually.

Objectives for the Bushley Bayou Unit of Catahoula Refuge were refined in the 1999 Environmental Assessment, Finding of No Significant Impact, and Land Protection Plan, prepared by the Service as the following:

- To provide habitat for wintering waterfowl and woodcock;
- To provide nesting habitat for wood ducks;
- To provide habitat for a natural diversity of wildlife;
- To provide habitat for non-game, neotropical migratory birds; and
- To provide opportunities for wildlife-oriented recreation, interpretation, and environmental education.

Prior to refuge establishment, lands that now make up the refuge were used for timber harvesting, agriculture, and open grazing. In 1925, the timber industry began logging in this area. Logging continued until 1936. In the early 1970s, a large portion of the land that now makes up the Bushley Bayou Unit of the refuge was cleared for agriculture, primarily for soybeans.

Historically, local residents used the land for open grazing of cattle and hogs. Until the refuge was established and management began fencing different portions of the refuge in 1966, open grazing in Catahoula Lake and surrounding areas reached an estimated 2,500 head of cattle and 5,000 head of hogs, using 5,000 acres annually. Gradual fencing of the refuge lands reduced the impacts of grazing but has left a legacy of open fields with compacted soil that has been difficult to reforest to historic conditions. As of 2004, open grazing is no longer permitted in either parish (USFWS, 1995a; Hammond, 2004).

Located 30 miles northeast of Alexandria, the original refuge lands acquired now make up the majority of the Headquarters Unit. About 745 acres of the refuge are used for administrative purposes, including the headquarters building and area, maintenance and storage buildings, as well as roads and trails. The headquarters and most of the maintenance and storage buildings are on the Headquarters Unit.

The second major unit, Bushley Bayou, was established in 2001 for the benefit of migratory birds and other wildlife in east central Louisiana. Its northern portions are about 8 miles west of Jonesville and 35 miles northeast of Alexandria. In January 2001, The Conservation Fund, American Electric Power, and the Service signed a partnership agreement to acquire the entire Tensas Delta Land Company Tract, totaling 18,571 acres. The Conservation Fund bought the property from Tensas Delta and sold 10,000 acres to American Electric Power and 8,000 acres to the Service. American Electric Power agreed to provide \$300,000 to the Service to assist with startup operations and maintenance. The Service also has an agreement to manage the 10,000 acres owned by American Electric. The partnership brings together the federal government, a conservation organization, and private industry to restore and protect habitat for wintering waterfowl and migratory birds and to

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manage bottomland hardwood forests. The Service entered this partnership to restore biodiverse ecosystems through the re-creation of natural forest habitat, which, in turn, will result in carbon sequestration.

The Service purchased 14,587 acres, including 3,600 acres of USDA's Natural Resources Conservation Service Wetlands Reserve Program land and 6,052 acres acquired using Wal-Mart's Acres for America Program, National Fish and Wildlife Foundation, and North American Wildlife Conservation Agreement grant monies, from The Conservation Fund. The Conservation Fund sold the remaining 4,205 acres to American Electric Power. Under a 10-year Memorandum of Agreement between American Electric and the Service, the Service would manage the American Electric lands as part of the refuge; Americana Electric would reforest the lands on the Bushley Bayou Unit for potential future carbon credits.

**Table 1. Location/acreage of lands within approved acquisition boundary**

<b>Location</b>	<b>Acres</b>
Headquarters Unit – Service Owned	6,671
Bushley Bayou – Service Owned	14,587
Bushley Bayou – Owned by American Electric Power and Service Managed	3,984
Remainder of Acres Outside of Refuge Boundary, but within the current Acquisition Boundary - Privately Owned	3,012

## **SPECIAL DESIGNATIONS**

### *OIL AND GAS ACTIVITIES*

According to the Government Accounting Office Report of 2003, the Catahoula Refuge has eight active wells, one orphan well, and forty-nine inactive wells (Figure 3 and 4). At present only four of the active wells are in production. The remaining four wells are not operating. There are currently two sites that have been staked out for potential well sites on the Headquarters Unit. There are active pipelines on the refuge (Government Accounting Office 2003). There are four tank batteries (e.g., treatment and storage facilities) on the refuge. Previously, pipelines were used exclusively to transport oil and gas off the refuge; currently, pipelines, as well as tanker trucks, are used to transport oil from the refuge. The owners inspect the equipment daily to ensure proper functioning. The refuge issues special use permits for conducting oil production activities, such as facility maintenance.

### *PARTNERSHIPS*

The refuge works with a number of partners on conservation and management programs. A major effort was in the acquisition and reforestation of the Bushley Bayou Unit. The Conservation Fund, American Electric Power, and the Service worked together to acquire land from the Tensas Delta Land Company. The Conservation Fund bought the land and sold 14,587 acres to the Service and 3,984 acres to American Electric. American Electric Power and the Service entered into a Memorandum of Agreement to have the refuge manage the power company lands for ten years. The agreement also included American Electric's reforestation efforts on both Service and power

Figure 3. Oil and gas activity on the Headquarter's Unit of Catahoula National Wildlife Refuge

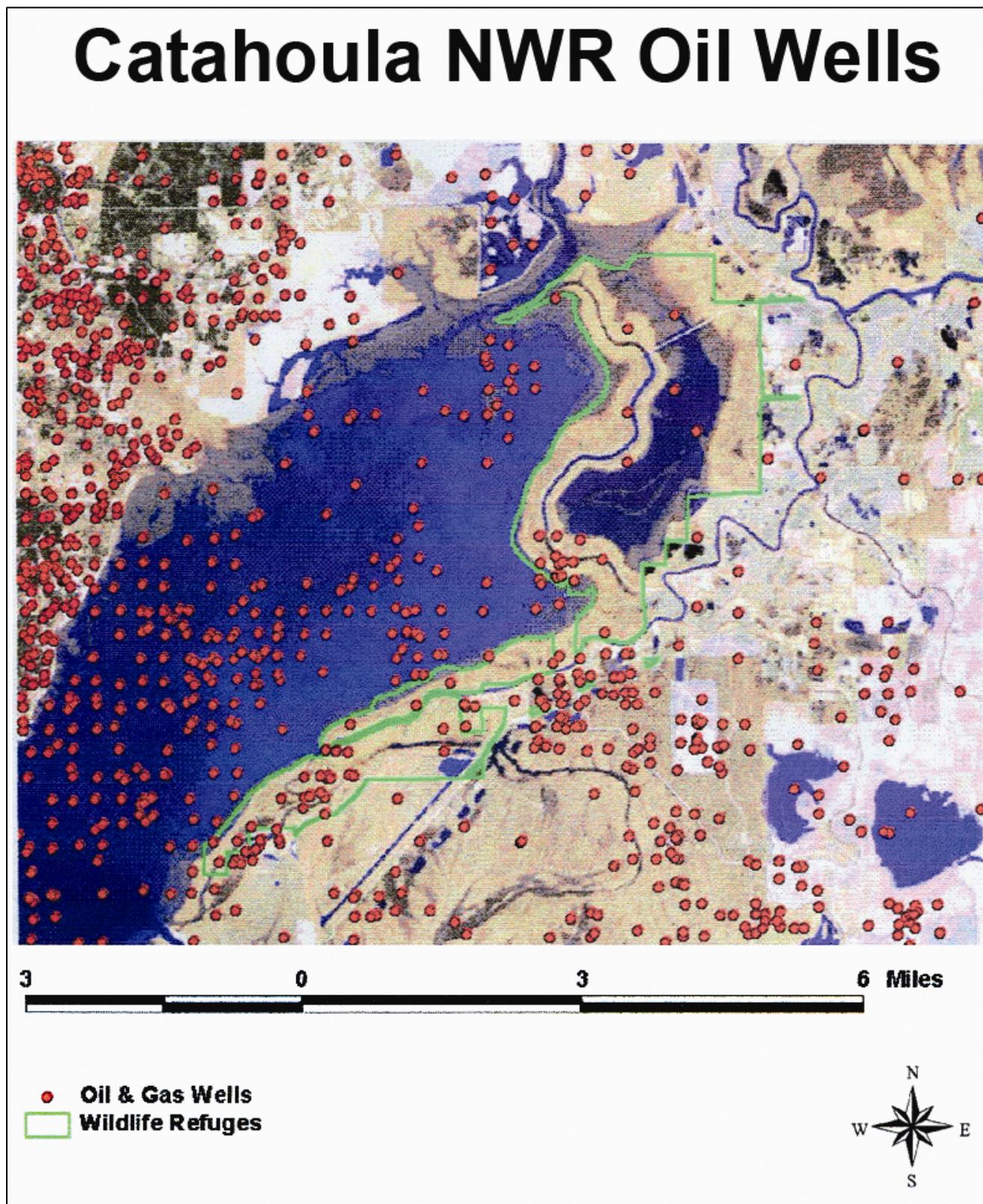
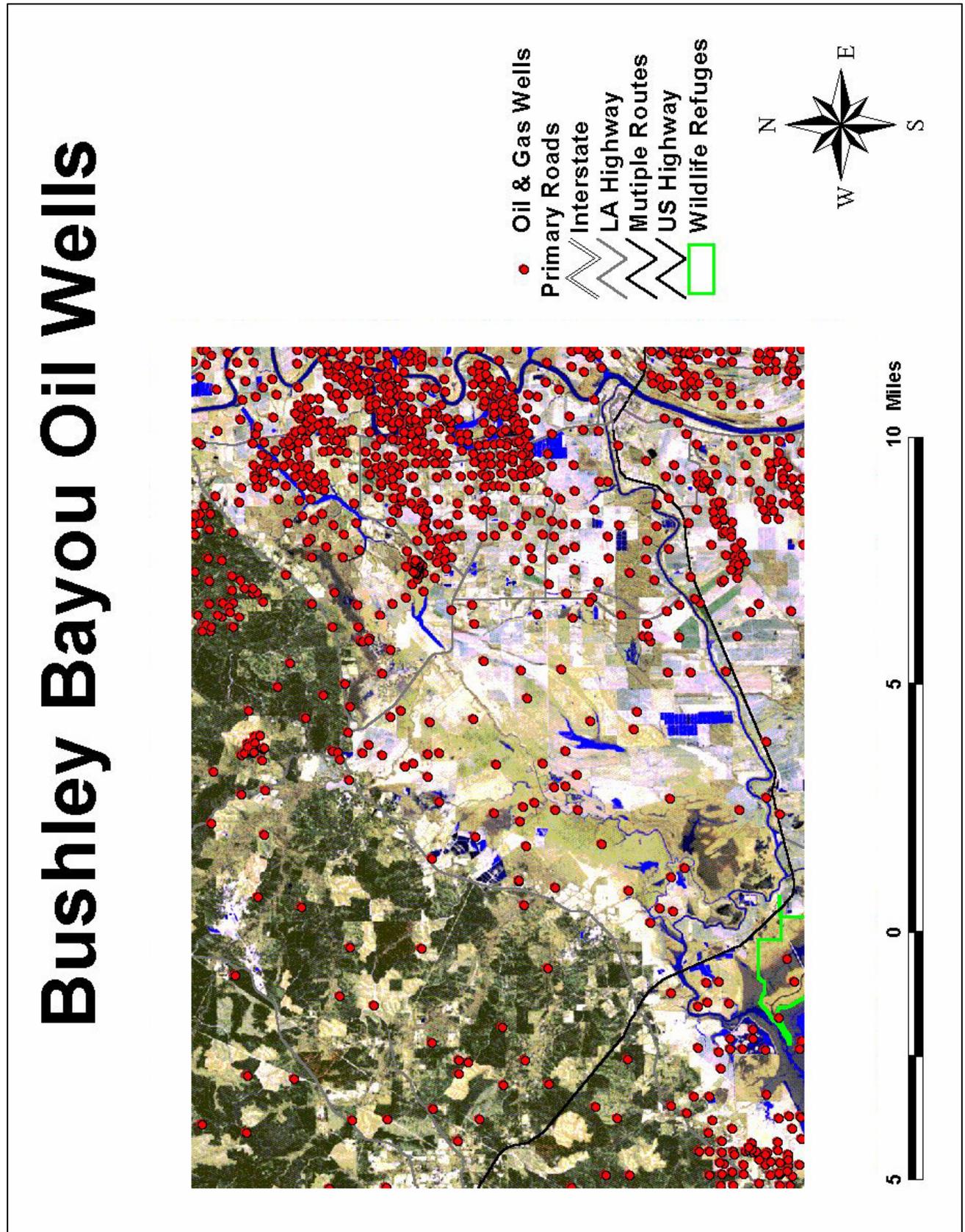


Figure 4. Oil and gas activity on the Bushley Bayou Unit of Catahoula National Wildlife Refuge



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company land for carbon sequestration credits. The Conservation Fund has recently donated 6,273 acres to the Service on the Bushley Bayou Unit, working with North American Wildlife Conservation Agreement and National Fish and Wildlife Foundation through Wal-Mart's Acres for America Program.

Environmental Synergy, Inc., represents private sector companies, such as American Electric Power, interested in addressing the effects of global climate change through reforestation of selected tracts of land that will promote the sequestration of carbon and restore wetland habitat in the Mississippi Alluvial Valley. On the Bushley Bayou Unit, Environmental Synergy was contracted to reforest the sites that were selected under the agreement. The Service cooperated with Environmental Synergy, Inc., in coordinating the reforestation process, including the selection of species and planting sites.

The refuge works closely with the LDWF and with the Army Corps of Engineers in a tri-party agreement under which the refuge manages the water level on Catahoula Lake.

The refuge also cooperates closely with the Natural Resources Conservation Service. Portions of the refuge, including several impoundments, are under the wetlands reserve program. These lands are in the Bushley Bayou Unit and are owned by the Service. The Service must comply with the same regulations that apply to private land enrolled in the wetlands reserve program.

#### *GLOBALLY IMPORTANT BIRD AREA*

The refuge is designated as a globally important bird area for wintering waterfowl and shorebirds under the American Bird Conservancy Important Bird Areas Program.

Since 1995, the the American Bird Conservancy has designated 500 important bird areas as the top sites of significance on a global level for birds throughout the 50 states. Sites include national wildlife refuges, national parks and forests, state lands, conservation lands, and private lands. For these identifications, the American Bird Conservancy has used objective scientific information and the recommendations of experts. In order to be included in

the American Bird Conservancy Important Bird Areas Program, a site must contain critical habitat that supports a significantly large concentration of breeding, migrating, or wintering birds, including waterfowl, seabirds, wading birds, raptors, and landbirds, during at least some part of the year. The important bird area designation is an important step towards raising the awareness of the public and land managers about the importance of a site and its value to bird conservation (ABC, No date).

#### *RAMSAR DESIGNATION OF CATAHOULA LAKE*

The most prominent international treatment of wetlands is the Convention on Wetlands of International Importance, often referred to as the Ramsar Convention, for a treaty that was signed in Ramsar, Iran, in 1971. The Ramsar Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It was the first of the modern global intergovernmental treaties on wise use of natural resources.

Participating countries must designate at least one wetland for inclusion on the List of Wetlands of International Importance. There are 146 Contracting Parties to the Convention, including the United States, which ratified the treaty in 1986. Currently there are 1,436 wetland sites, totaling 125.1 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.

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The Ramsar Convention designated Catahoula Lake, which borders nine miles of Catahoula Refuge, as a Wetlands of International Importance (Ramsar site) in 1991. The lake is one of 18 wetland sites (one of six southern wetlands) in the United States recognized as a Wetlands of Importance globally. Under the Ramsar Convention, there is an obligation for parties to include wetland conservation considerations in their land use planning. Under the Ramsar Convention, planning is to promote the wise use of wetlands, which has been interpreted as being synonymous with “sustainable use” (Ramsar, No date; Messina and Conner, 1998).

## **ECOSYSTEM CONTEXT**

Catahoula Refuge lies within the Mississippi Alluvial Valley (Figure 5). The MAV was once a 25-million-acre complex of forested wetlands that extended along both sides of the Mississippi River from Illinois to Louisiana. Historically, the extent and duration of seasonal flooding from the Mississippi River fluctuated annually, with floods recharging the MAV’s aquatic systems and creating a rich diversity of dynamic habitats that supported a vast array of fish and wildlife resources.

The declines in the MAV’s bottomland hardwood forests and their associated fish and wildlife resources have prompted the Service to designate this forest system as an area of special concern. A collaborative effort involving private, state, and federal conservation partners is now underway to employ a variety of tools to restore the functions and values of wetlands in the MAV. The goal is to prioritize and manage wetlands to most effectively maintain and possibly restore the biological diversity in the MAV. Some areas are prioritized as focus areas for reforestation.

It is widely recognized, however, that most of the 20+ million acres of forested wetlands that have been cleared and converted to other uses in the MAV will not be reforested. Some areas would have low value for reforestation and are targeted for intensive management for non-forest-dependent species, such as waterfowl and shorebirds. Through cooperative efforts, apportioning resources, and the focusing of available programs, the MAV’s biological diversity can be improved.

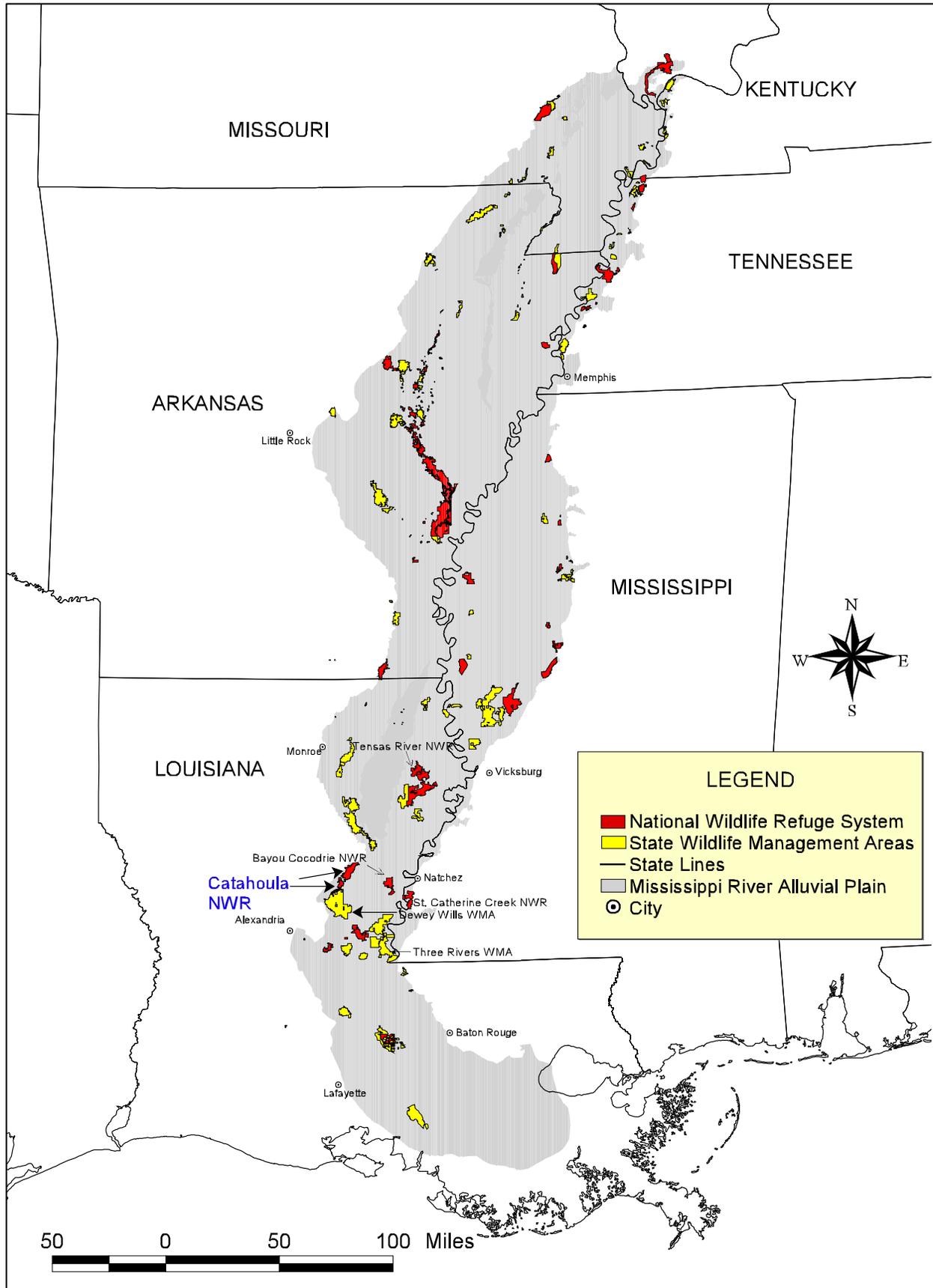
## **REGIONAL CONSERVATION PLANS AND INITIATIVES**

Catahoula Refuge is part of the Lower Mississippi River Ecosystem and is considered to be in the MAV. As such, the refuge is a component of many regional and ecosystem conservation planning initiatives, which are described in the following paragraphs.

Lower Mississippi River Ecosystem (LMRE) Plan. The purpose of this plan is to guide Fish and Wildlife Service efforts to conserve, restore, and enhance the natural functional processes and habitat types of the LMRE unit while maintaining the economic productivity and recreational opportunities of the region. The LMRE Plan has eight major goals, consisting of the following:

1. Conserve, enhance, protect, and monitor migratory bird populations and their habitats.
2. Protect, restore, and manage wetlands.
3. Protect and/or restore imperiled wetlands and viable populations of endangered species of concern.
4. Protect, restore, and manage the fisheries and other aquatic resources historically associated with the wetlands and waters of the ecosystem.
5. Restore, manage, and protect national wildlife refuges and national fish hatcheries.
6. Increase public awareness and support for LMRE resources and their management.
7. Enforce natural resource laws.
8. Protect, restore, and enhance water and air quality throughout the ecosystem.

**Figure 5: Mississippi Alluvial Valley**



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The Lower Mississippi Valley Joint Venture (LMVJV). The LMVJV is a private, state, and federal bird conservation partnership conceived in 1988 in response to the North American Waterfowl Management Plan described previously in Chapter I. The LMVJV was established as a voluntary, non-regulatory partnership focused on increasing coordination of waterfowl and wetland habitat conservation in the MAV. Since its inception, the self-directed partnership has broadened its biological scope to include strategic planning and implementation for "all birds in all habitats," and its geographic extent to include the West Gulf Coastal Plain. In response to challenges inherent in landscape scale integrated bird conservation, LMVJV partners have organized their institutional capabilities and personnel expertise to (1) define a science-based biological foundation, (2) develop a spatially explicit conservation blueprint, and (3) orchestrate habitat delivery and management. Specifically, private, state, and federal LMVJV partners have invested over \$650 million to develop:

- Habitat objectives expressed at multiple scales linked to regional and continental bird populations based on testable assumptions regarding limiting factors.
- Geographic Information System (GIS) decision support models and conservation planning tools.
- Habitat and population tracking and monitoring programs.
- Focused research applying the principles of adaptive resource management.
- Habitat delivery programs that have helped to restore, enhance, or protect over one million acres of important wildlife habitat.

Partners in Flight (PIF). Partners in Flight have formed Bird Conservation Plans by Bird Conservation Regions that set conservation priorities and habitat and population objectives. Catahoula Refuge is part of the Saline Bird Conservation Area (Twedt et al., 1999). Habitats found on the refuge and associated bird species that are considered a priority in the MAV include:

- bottomland hardwood forest;
- Swainson's warbler, cerulean warbler, northern parula, painted bunting, prothonotary warbler, and Bell's vireo.

U.S. Shorebird Conservation Plan (USSCP). As mentioned previously in Chapter I, the USSCP is a partnership effort being undertaken throughout the country to ensure that shorebird populations are restored and protected.

Catahoula NWR is included in the Lower Mississippi Shorebird Planning Region and Bird Conservation Region. This plan recommends that public lands provide as much fall shorebird habitat as possible to meet the goal (520 hectare) of fall habitat in Louisiana. Catahoula Refuge is considered a Globally Important Bird Area for species such as: piping plover, American golden-plover, marbled godwit, ruddy turnstone, red knot, sanderling, buff-breasted sandpiper, American woodcock, and Wilson's phalarope.

North American Bird Conservation Initiative (NABCI). NABCI is a broad coalition of governmental, nongovernmental, and academic organizations interested in coordinating efforts to conserve bird populations and the landscapes upon which they depend. NABCI evolved in 1998 out of recognition among conservationists of the value of coordinating and integrating planning, implementation, and evaluation efforts of NAWMP, PIF, USSCP, and Waterbird Conservation for the Americas. The goal is to cause the combined effectiveness of these separate programs to exceed the total of their parts.

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U.S. Woodcock Plan. The U.S. Woodcock Plan was written by the Service in 1990 to “guide the conservation of woodcock in the United States.” Its objective is to protect and enhance wintering and migration habitat on public lands to increase woodcock carrying capacity. The plan also sets objectives to inventory and monitor woodcock habitat and develop management demonstration areas; however, objectives have not been stepped down to states or individual refuges. Although no step-down plans have been written, the plan gives general guidance for habitat population management at the national level.

Louisiana Comprehensive Wildlife Conservation Strategy (Wildlife Action Plan). The Louisiana Department of Wildlife and Fisheries' Comprehensive Wildlife Conservation Strategy was defined in 2005 (Lester et al., 2005). The mission statement follows:

The mission of the Louisiana Department of Wildlife and Fisheries is to manage, conserve, and promote wise utilization of Louisiana's renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, development, and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of the resources.

The State developed the following goals with associated objectives that this comprehensive conservation plan will consider and promote when establishing refuge goals and objectives to ensure the refuge and wetland management district continue their contribution to Louisiana wildlife conservation and habitat integrity.

- Provide the habitat and ecosystem functions that support healthy and viable populations of all species, avoiding the need to list additional species under the Endangered Species Act.
- Identify, conserve, manage, and restore terrestrial and aquatic habitats which are a priority for the continued survival of species of conservation concern.
- Support educational efforts to improve the understanding by the general public and conservation stakeholders regarding species of conservation concern and related habitats.
- Improve existing partnerships and develop new partnerships with state and federal natural resource agencies, non-governmental organizations and environmental groups, private industry, and academia.

The primary focus of the Louisiana comprehensive wildlife conservation strategy is species of conservation concern and the habitats they depend upon. Information relative to these species and those habitats found on Refuge System lands will be evaluated for opportunities to foster conservation efforts.

## **ECOLOGICAL THREATS AND PROBLEMS**

National wildlife refuges in the MAV serve as part of the last safety net to support biological diversity—the greatest challenge facing the Service. The greatest threats to biological diversity within the MAV 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 (i.e., 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.

### *FOREST LOSS AND FRAGMENTATION*

The MAV has changed markedly over the last 100 years as civilization spread throughout the area. From the 1950s to the 1990s, it has been estimated that 20 million acres of bottomland hardwood forested wetlands have been lost (Figure 6). The greatest changes to the landscape have been in the form of land clearing for agriculture and flood control projects.

Although these changes have allowed people to settle and earn a living in the area, they have had a tremendous effect on the biological diversity, biological integrity, and environmental health of the MAV. Vast areas of bottomland hardwood forests have been reduced to forest fragments ranging in size from very small tracts of limited functional value to a few large areas that have maintained many of the original functions and values of forested wetlands. This process, which is known as forest fragmentation, has reduced the size and connectivity of forest habitat patches and resulted in the disruption of extensive forest habitats into smaller and smaller isolated patches. Severe forest fragmentation has resulted in a significant decline in biological diversity and integrity. Species endemic to the MAV that have become extinct, endangered, or threatened include the red wolf, Florida panther, ivory-billed woodpecker, Bachman's warbler, and Louisiana black bear.

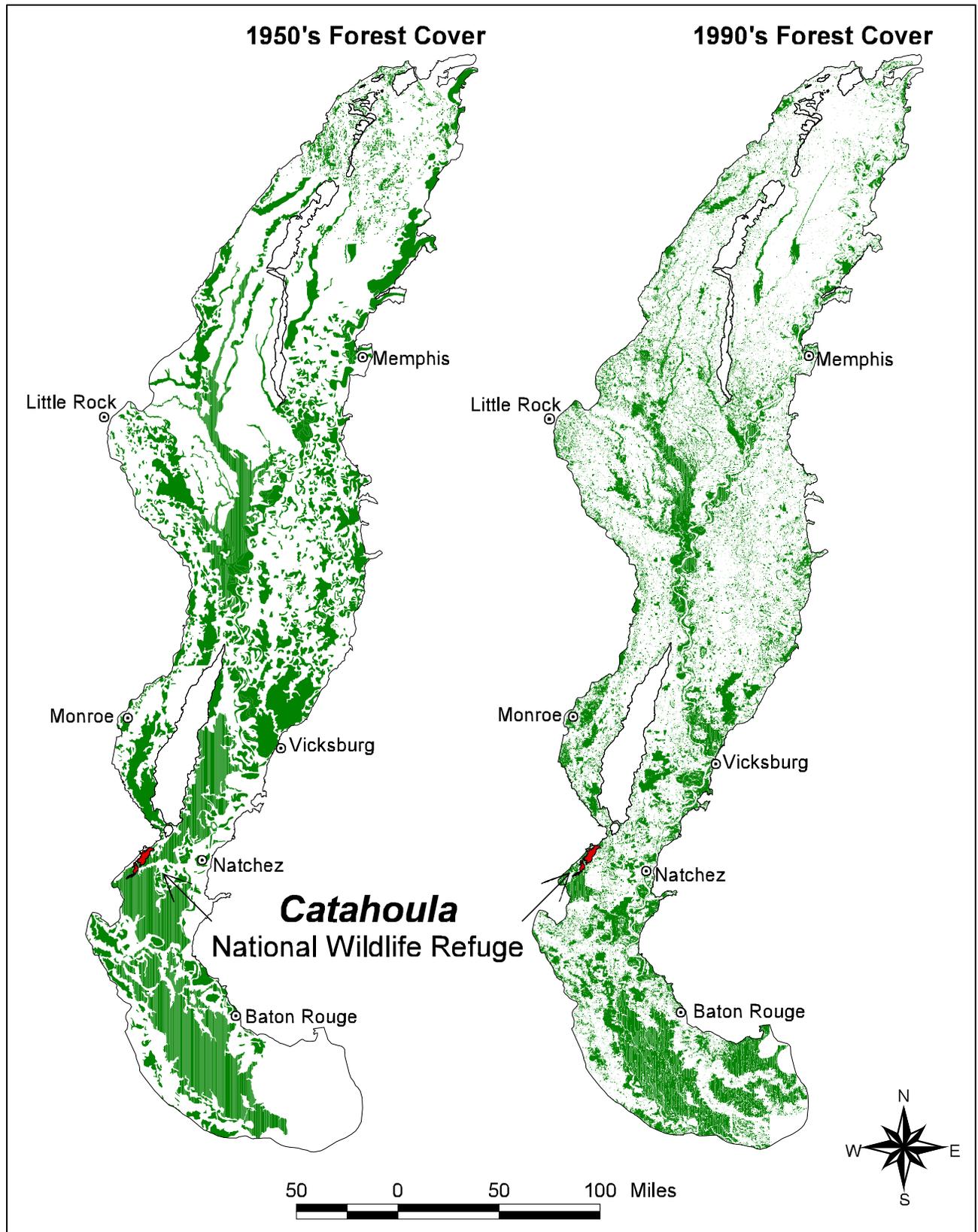
Breeding bird surveys show continuing declines in species and species populations. The avian species most adversely affected by forest fragmentation include those that are area-sensitive (i.e., dependent on large continuous blocks of hardwood forest); those that depend on forest interiors; those that have special habitat requirements, such as mature forests or a particular food source; and those that require good water quality.

More than 70 species of breeding migratory birds are found in the region. Some of these species, including Swainson's warbler, prothonotary warbler, swallow-tailed kites, wood thrush, and cerulean warbler, have declined significantly and need the benefits of large forested blocks to recover and sustain their existence.

Fragmentation has also brought forest edge along with the brown-headed cowbird (a seed-eating bird common in agricultural areas) closer to the natural nesting sites of many forest interior-nesting birds. The brown-headed cowbird is a parasitic nester that lays eggs in the nests of other birds, rather than building a nest of its own. Nestling cowbirds are typically larger and more aggressive and they out-compete the young of the species building the nest. This results in poor reproductive success and declining populations of forest interior-nesting species that are forced to nest near forest edges.

Fragmentation of bottomland hardwood forests has left many of the remaining forested tracts surrounded by a sea of agricultural lands. Intensive agriculture has removed most of the forested corridors along sloughs that formerly connected the forest patches. The loss of connectivity between the remaining forested tracts hinders the movement of wildlife between tracts and reduces the functional values of many remaining smaller forest tracts. The lost connections also result in a loss of gene flow. Restoring the connections to allow gene flow and reestablish travel corridors is particularly important for some wide-ranging species, such as the threatened Louisiana black bear.

Figure 6: Forest cover changes in the MAV



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## *ALTERATIONS TO HYDROLOGY*

In addition to the loss of vast acreage of bottomland forested wetlands, there have been significant alterations in the region's hydrology due to urban development, river channel modification, flood control levees, reservoirs, and deforestation, as well as degradation to aquatic systems from excessive sedimentation and contaminants.

The natural hydrology of a region is directly responsible for the connectedness of forested wetlands and indirectly responsible for the complexity and diversity of habitats through its effects on topography and soils. Natural resource managers recognize the importance of dynamic hydrology to forested wetlands and waterfowl-habitat relationships (Fredrickson and Heitmeyer 1988).

The large-scale man-made hydrological alterations replacing the natural hydrology have changed the spatial and temporal patterns of flooding throughout the entire MAV. In addition, these alterations have reduced both the extent and duration of annual seasonal flooding. The loss of this annual flooding regime has had a tremendous effect on the forested wetlands and their associated wetland-dependent species.

In view of the hydrologic changes, it is very difficult—if not impossible—to fully emulate and reconstruct the structure and functions of a natural wetland. According to Mitsch and Gosselink (1993), restoration of wetland functions is especially difficult since wetlands depend on a dynamic interface of hydrologic regimes to maintain water, vegetation, and animal complexes and processes.

## *SILTATION OF AQUATIC ECOSYSTEMS*

Aquatic systems, including lakes, rivers, sloughs and bayous, have been degraded as a result of deforestation and hydrologic alteration. Clearing of bottomland hardwood forests has led to an accelerated accumulation of sediments and contaminants in all aquatic systems. Many water bodies are now filled with sediments, greatly reducing their surface area and depth. Concurrently, the non-point source runoff of excess nutrients and contaminants is threatening the area's remaining aquatic resources. The Service lists 39 species of fish as threatened, 67 species as endangered, and 16 species as either species of concern or proposed for listing in the MAV.

Hydrologic alterations have basically eliminated the geomorphological processes that created oxbow lakes, sloughs, and river meander scars. Consequently, the protection, conservation, and restoration of these aquatic resources take on an added importance in light of the alterations associated with flood control and navigation.

## *PROLIFERATION OF INVASIVE AQUATIC PLANTS*

Compounding the problems faced by aquatic systems is the growing threat from invasive aquatic vegetation. Static water levels caused by the lack of annual flooding and reduced water depths resulting from excessive sedimentation have created conditions favorable for the establishment and proliferation of several species of invasive aquatic plants. Additionally, the introduction of exotic (nonnative) vegetation capable of aggressive growth is further threatening viability of aquatic systems. These invasive species threaten the natural aquatic vegetation important to aquatic systems, and choke waterways to a degree that often prevents recreational use.

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## PHYSICAL RESOURCES

### CLIMATE

Central Louisiana has mild winters and hot, humid summers. Temperatures range from 52° F in January to 82° F in July, with an average annual temperature of 67° F. Spring and summer are often wet, with an average annual rainfall of 71.21 inches.

### GEOLOGY AND TOPOGRAPHY

Louisiana has a relatively young geologic history. Most surface deposits are marine and deltaic sediments that have been deposited in alternating cycles over the past 1.8 million years.

During the Tertiary period, which extended from 65 to 1.8 million years ago (mya), the refuge was covered with a sea. In the early Eocene epoch (54 mya), the sea receded as the continental ice sheets advanced, resulting in alluvial deposits from rivers flowing into the Gulf of Mexico. This trend was reversed in the late Eocene, as sea level rose again. At this time, the sea again covered the refuge. Finally, in the Miocene epoch (25 to 5 mya), the sea level dropped and sedimentation began to accumulate, extending land gulfward (LGS 1990).

The alluvial soils that accrued since the Miocene have formed what topography exists in the refuge. The refuge is in the far western edge of the MAP ecosystem province, adjacent to the Gulf Coastal Plain ecosystem province. The province consists of flat to gently sloping broad floodplain and low terraces made up of mostly clay alluvium. The average elevation (above mean sea level) is 30 feet. The only noticeable slopes are sharp terrace scarps and natural levees that rise sharply to several meters above adjacent bottom lands or stream channels (Bailey 1995; LGS 1990).

### SOILS

The dominant soil series on the refuge consist of the following:

*Alligator-Sharkey-Tensas* - The broad backswamps, depressions, and sloughs are located on the low terraces of streams and tributaries, with slopes less than one percent. Some slopes range to five percent on short escarpments bordering channels. Soils in these areas (*Alligator-Sharkey-Tensas*) are poorly drained, with ponding in the depression areas. Areas along the lower courses of tributary streams to the Mississippi River are subject to backwater flooding.

*Dundee Sharkey* - Natural levees and low terraces along former channels of the Mississippi River contain soils formed in thinly stratified beds of loamy alluvium (*Dundee-Water-Sharkey*). These hydric soils are very deep and somewhat poorly drained, with slopes of zero to one percent.

*Guyton Smithdale* - In the northwestern portion of the refuge, soils are formed on local stream floodplains and in depression areas (*Guyton Smithdale*), rather than derived from alluvium from the Mississippi River. Slopes range from zero to one percent, and soils are poorly drained, with year-round ponding in places. A seasonal high water table is at 0 to 1.5 feet below the surface from December through May (NRCS 2004; STATSGO 1998).

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## HYDROLOGY

The refuge lies 30 miles west of the Mississippi River in the Mississippi Alluvial Valley. The area is subject to extensive annual backwater flooding that affects both the refuge and the adjacent Catahoula Lake (USFWS 1989).

Catahoula Lake is 26,000-acre ephemeral lake that borders the west boundary of the refuge's Headquarters Unit. This shallow lake basin is subject to drastic seasonal fluctuations. In addition, the hydrology of Catahoula Lake and surrounding rivers, streams, and bayous has been substantially altered by the Ouachita and Black River Navigation Project (1972). Before project construction, water flowed into the lake primarily through the Little River and drained through the French Fork of the Little River to the Ouachita River. Water still drains out through the French Fork of the Little River today; however, most of it flows out of the Catahoula Lake Diversion Canal to the Black and Red Rivers (USFWS 1989).

The Catahoula Lake water levels are managed by refuge personnel under a tri-party cooperative agreement with the Louisiana Department of Wildlife and Fisheries, the Army Corps of Engineers, and Fish and Wildlife Service. Water management activities are specified in a Water Management Agreement and are primarily designed to emulate former natural conditions. The specifications promote desirable waterfowl habitat, which provides public waterfowl and migratory bird hunting opportunities. It also allows for commercial fishing and oil rig maintenance during high water levels, and it addresses lead shot issues.

Backwater flooding from the Mississippi River has a major hydrological impact on the refuge. Backwater moves from the Red River to the Black River, and then through the diversion canal to the lake. Backwater can also enter the lake from the Ouachita River through the French Fork of the Little River or through Bushley Creek.

In some years backwater flooding can be substantial, flooding refuge roads, and in some cases, it raises the level of the lake so high that no water management is possible.

There are several impoundments on both the Headquarters and the Bushley Bayou Units. There are also a number of small shallow lakes on the Bushley Bayou Unit, which are fed by perennial creeks, such as Greens Creek, Coons Creek, Rhinehart Creek, Dry Bayou, and Flat Creek, which flow out of the hills easterly to the refuge (USFWS 1999a).

## AIR QUALITY

The Clean Air Act, which was last amended in 1990, required the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of NAAQS. *Primary standards* set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (EPA 1993).

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The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria pollutants" including carbon monoxide (CO), ozone (O<sub>3</sub>), lead (Pb), particulate < 10 micrometers (PM-10), and sulfur dioxide (SO<sub>2</sub>) (EPA, 1993). Areas that do not meet the primary standard for a pollutant are non-attainment areas for that pollutant.

Catahoula and La Salle Parishes are in attainment areas for these NAAQS. Louisiana violates the standard for ozone in five parishes - Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge. Collectively, these parishes are called the *Baton Rouge Nonattainment Area* (Tullier 2005; LDEQ 1997).

The Clean Air Act also established Class I, II, and III "Prevention of Significant Deterioration" areas with limits on the concentration of a criteria air pollutant that can exist in certain geographic areas. Class I areas allow for very little deterioration of air quality. An example of such an area is a designated Wilderness Area. A Class II designation allows for more deterioration than Class I. Class III areas allow even more deterioration than Class II (USFWS 2002a).

### *WATER QUALITY AND QUANTITY*

Section 303(d) of the Clean Water Act requires states to identify water bodies that fail to meet one or more applicable water quality standards and need total maximum daily levels (TMDLs). Louisiana's Section 303(d) List of Water Bodies identifies impaired water bodies and establishes a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of the water bodies. The Section 303(d) listing requirement applies to water bodies impaired by point and non-point sources.

There are no 303(d) listed waters on the refuge; however, Catahoula Lake is listed by EPA as a 303(d) impaired water body for oil and grease, salinity, chlorides, and sulfates. The lake floods the refuge at certain high-water levels, potentially impacting all water bodies. Suspected sources are rangelands, petroleum activities, flow regulations/modifications, and municipal sources (LDEQ 1999). Catahoula Lake also has a fish consumption advisory due to high mercury levels.

## **BIOLOGICAL RESOURCES**

### *HABITAT*

The refuge lies within the MAV. The MAV was, at one time, a 25-million-acre forested wetland complex that extended along both sides of the Mississippi River from Illinois to Louisiana. Although the refuge was part of this very productive bottomland hardwood ecosystem, most of the forests on nearby lands were cleared for agricultural production. No forests have been cleared within the Headquarters Unit while it has been part of the Refuge System. Most of the Willow Lake Unit of the Headquarters Unit was cleared in the late 1960s and early 1970s as was most of the forest on the Bushley Bayou Unit. In both cases this clearing occurred before the Service acquired these lands.

Catahoula Refuge is low-lying bottomland subject to extensive flooding on the western edge of the Mississippi River alluvium. Currently, the refuge provides a mix of various habitat types, including remnant pieces of bottomland hardwood forest, reforested areas, lakes, bayous, cypress sloughs, moist-soil areas, and open grassland on one field in the Willow Lake area (Table 2).

**Table 2. The habitat types and associated acreages found on Catahoula National Wildlife Refuge**

Habitat	
Type	Acres
Bottomland hardwood forest	8,599
Reforested open fields	13,868
Moist-soil units	580
Lakes/streams/bayous/open water	1,275
Grassland	95
Admin/oil and gas/roads/pipelines, etc.	745

### **Bottomland Hardwood Forest**

Since the inception of the refuge, approximately 13,868 acres have been reforested or are reverting naturally to a bottomland hardwood community. Primary species planted in the reforested areas are: (1) willow oak; (2) green ash; (3) bald cypress; (4) Nuttall oak; and (5) overcup oak.

On the Headquarters Unit, over 464 acres have been reforested with Nuttall oak, willow oak, water oak, Shumard oak, persimmon, baldcypress, and green ash. In 1976, a 40-acre agricultural field in the French Fork area of the Headquarters Unit was taken out of production and reforested with Nuttall oak seedlings by Boy Scouts. About five acres near the headquarters office were reforested in 1980-81 with Nuttall oak, water oak, willow oak, sweet pecan, and baldcypress. The Willow Lake area was reforested in 1998 (187 acres) and 1999 (232 acres), totaling 419 acres, and replanted due to failures in 2000 (190 acres) and 2002 (43 acres) (Figure 7).

On the Bushley Bayou Unit, a total of 13,404 acres have been reforested. Approximately, 9,784 acres have been reforested for future potential carbon sequestration credits under the U.S. Department of Energy's Global Climate Change Program. This program aims to reduce greenhouse gases in the atmosphere, partly by the sequestration of carbon in biomass. In return, the program creates a record of emissions' reductions that could possibly be used by the funding clients (in this case American Electric Power) for "credit" against future mandatory requirements. In addition, prior to The Conservation Fund's purchase of the Bushley Bayou lands, Tensas Delta Land Company reforested 3,620 acres through the Wetlands Reserve Program, bringing the total of reforested areas to 13,404 acres (Figure 8).

The acreage on the Bayou Bushley Unit was planted with native oaks, including willow oak, Nuttall oak, overcup oak, and Shumard oak, baldcypress, green ash, and pecan trees. Within these reforested areas, many native "volunteer" species, including swamp privet, button bush, water elm, bitter pecan, green ash, sweet gum, sycamore, and river birch, have grown.

Figure 7. Reforestation on Catahoula National Wildlife Refuge Headquarters Unit

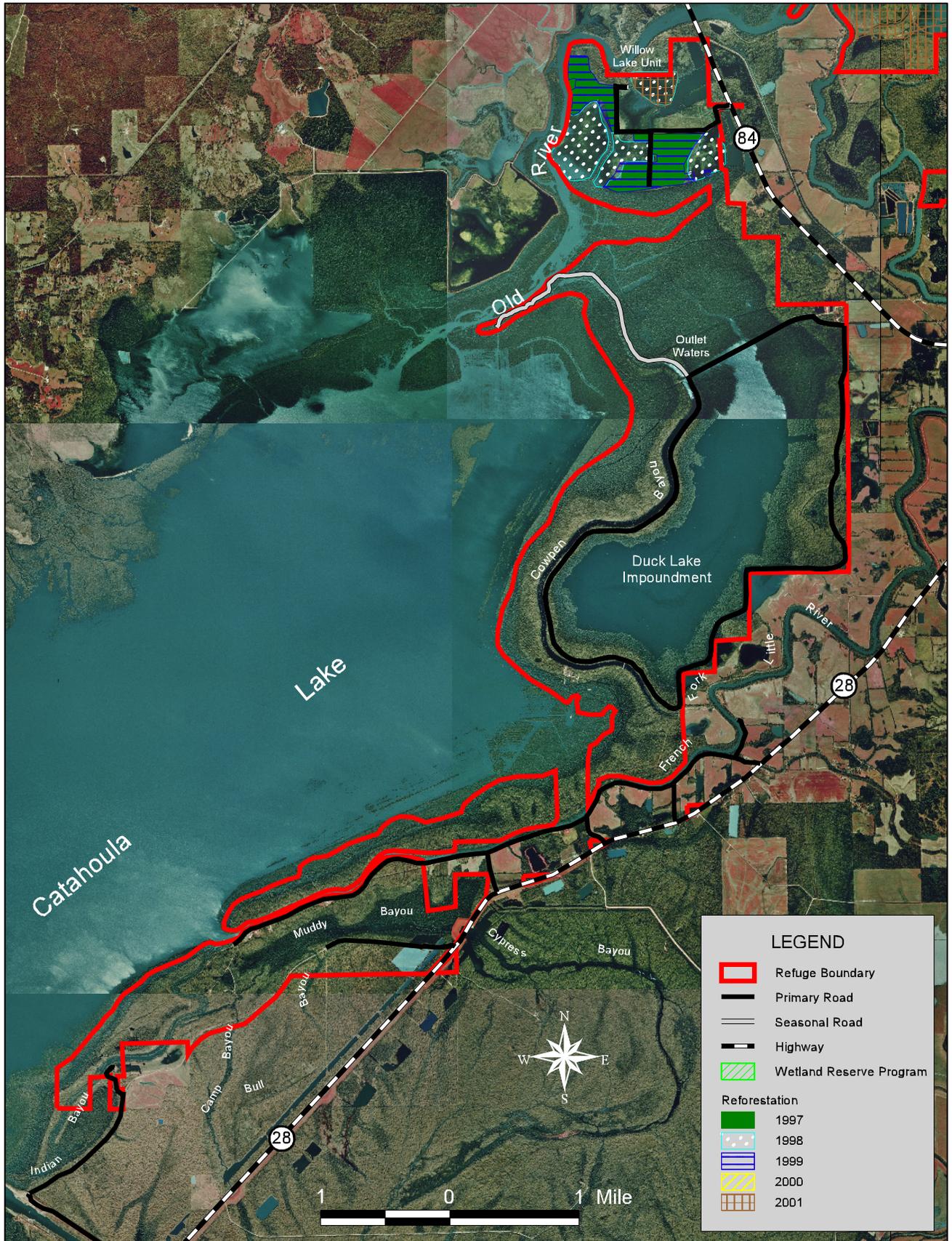
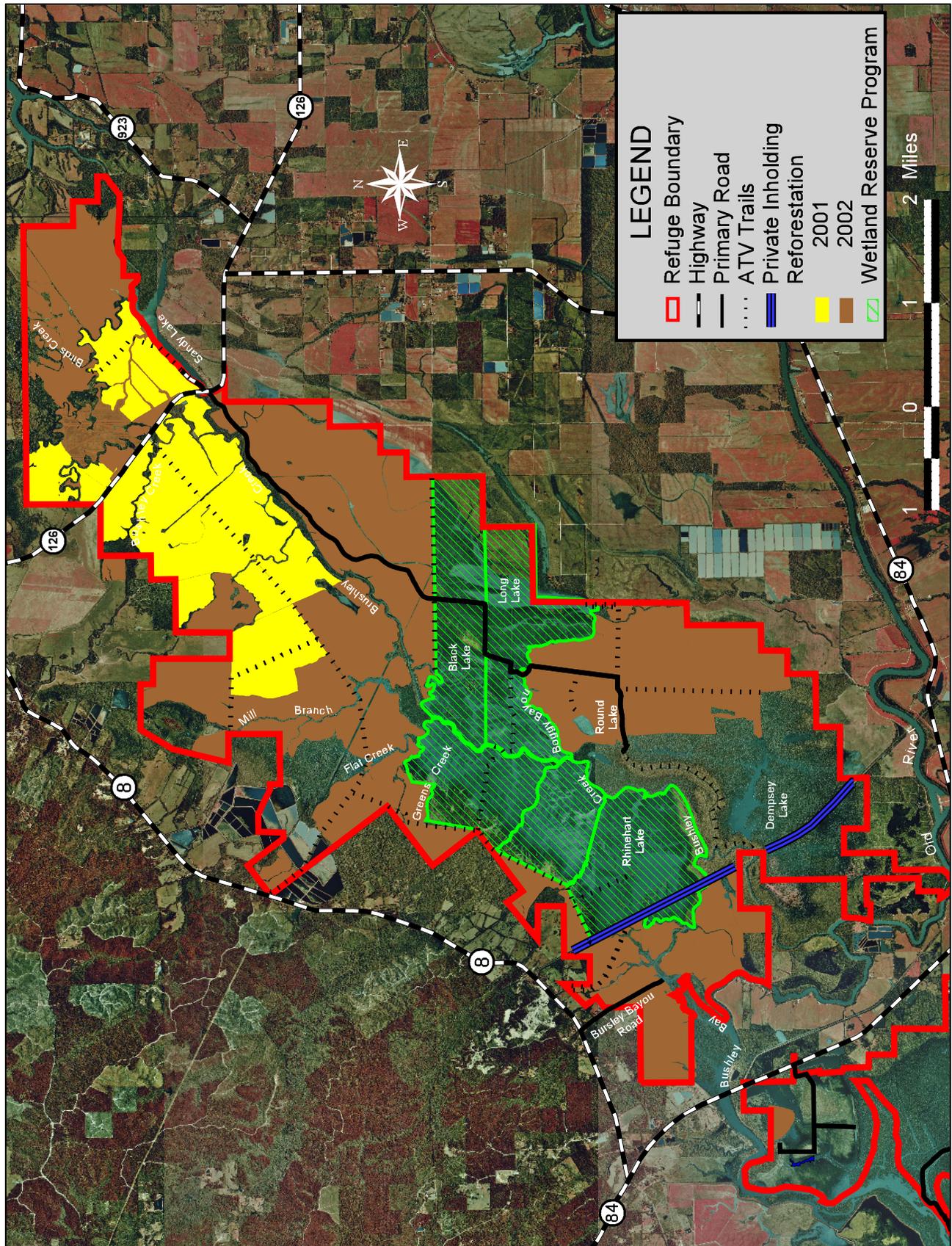


Figure 8. Reforestation on Catahoula National Wildlife Refuge Bushley Bayou Unit



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## Moist-soil and Water Management

Refuge staff manages water on the refuge to provide habitat for wintering waterfowl, shorebirds, and wading birds on several impoundments (Figures 9 and 10). In managing the impoundments, the staff creates moist-soil units that produce natural, desirable vegetation for waterfowl to consume during the fall and winter months. These moist-soil units also benefit shorebirds and wading birds. There are 16 water control structures on the refuge.

The largest impoundment is Duck Lake, which is roughly 1,200 acres, on the Headquarters Unit. Water control became functional on this impoundment in 1980 with the installation of a water control structure within the levee at the outflow end of the impoundment. In 2001, a new water control structure was constructed to replace the old structure in conjunction with a federal highways road project whereby the Duck Lake levee was raised and widened. The new structure has two screwgates and a concrete weir within the structure with an 8-foot square box culvert through which the water flows, connecting Duck Lake to Duck Lake Slough.

The refuge manages water levels on the Duck Lake Impoundment in coordination with Catahoula Lake management by raising levels before the state duck hunting season in mid-November. When the refuge staff closes the water control structure on Catahoula Lake, they also close the Duck Lake structure to hold rain and runoff in the impoundment. To draw down water on the impoundment, the refuge opens the water control structure to allow water to drain out of the impoundment to the outlet waters (Duck Lake Slough) and into the Big Bay portion of Catahoula Lake and eventually to the Catahoula Lake diversion canal. (Water is not drawn out of Catahoula Lake into Duck Lake. Only when there is a flood event does water from Catahoula Lake backflow into the Duck Lake Impoundment.)

Several other impoundments on the Headquarters Unit have stop-log water control structures, including a small seven-acre impoundment on the Willow Lake area.

The water within Cowpen Bayou on the Headquarters Unit is also managed, not for moist-soil but for fisheries resources. The water control structure is used to move water between Cowpen Bayou and Duck Lake. Cowpen Bayou and the Highway 28 borrow pits are the only water bodies on the Headquarters Unit open to fishing year-round.

There are several impoundments managed for moist-soil on the Bushley Bayou Unit. Some of these have stop-log water control structures, including Long Lake, a 60-acre impoundment along the east boundary of the Bushley Bayou Unit, as well as one of the five impoundments north of Rhinehart Lake that were constructed by the Natural Resources Conservation Service's Wetlands Reserve Program. The other four Wetlands Reserve Program impoundments are passive in that they do not have control structures. These permanent water areas depend on rain, backwater, or runoff to fill the impoundments.

Figure 9. Waterfowl impoundments on Catahoula National Wildlife Refuge Headquarters Unit

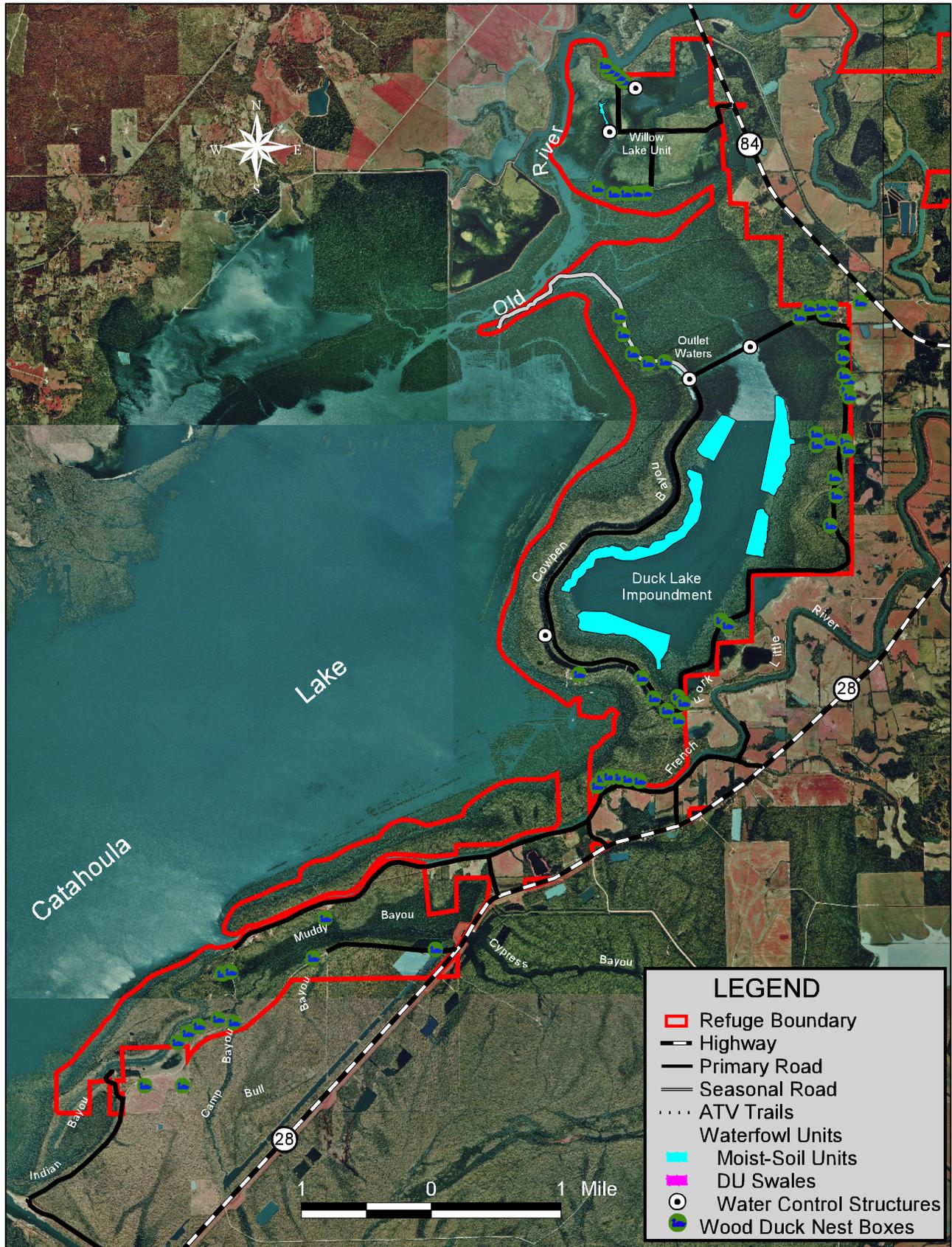
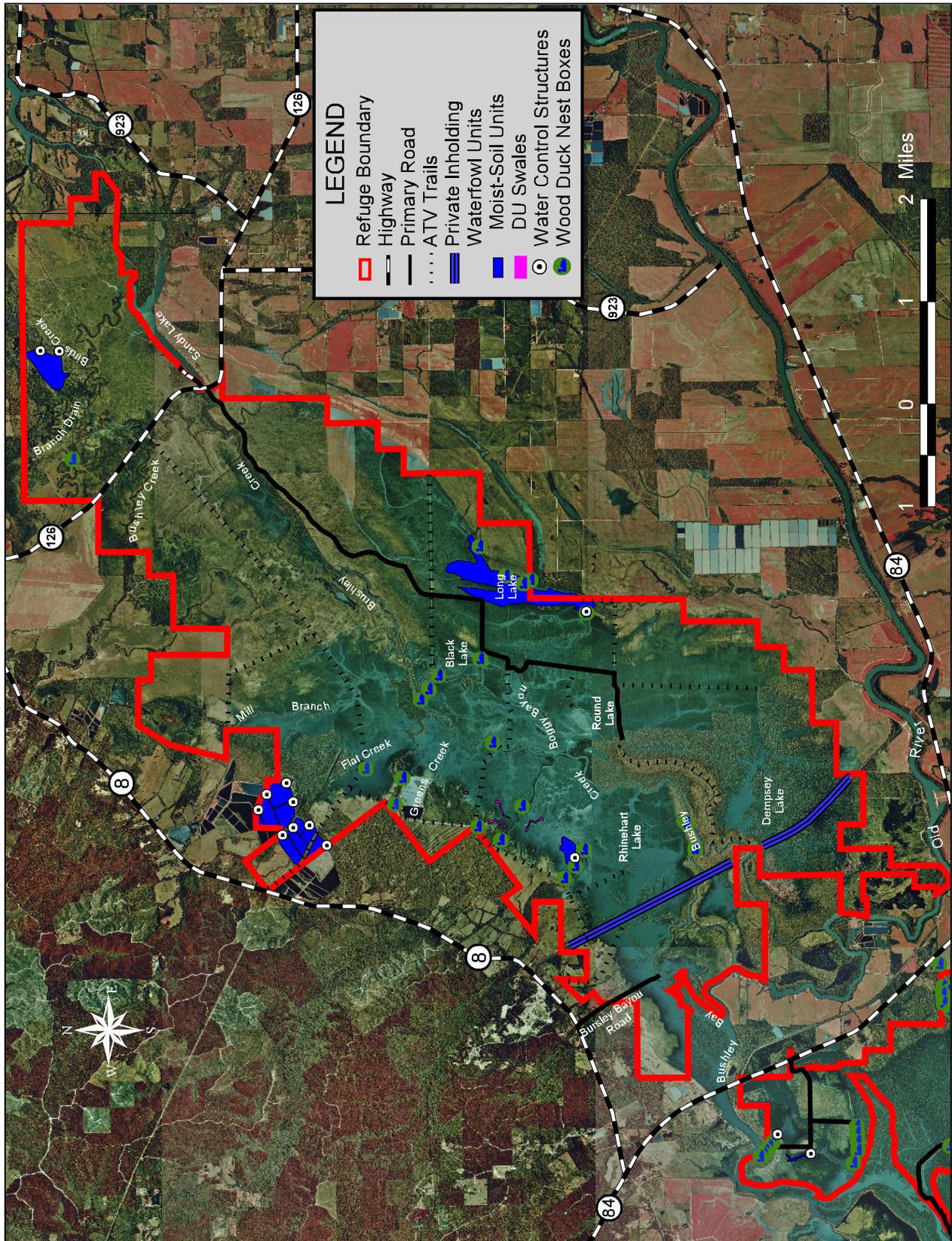


Figure 10. Waterfowl impoundments on Catahoula National Wildlife Refuge Bushley Bayou Unit



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In addition to managing water on Catahoula Refuge, the refuge staff also manages water levels on Catahoula Lake. Historically, Catahoula Lake was a natural moist-soil wetland that was subject to major seasonal fluctuations in water level. Under natural conditions the lake typically flooded in the winter and spring, and dried out progressively during the summer. It was fed primarily by Little River on the northwestern shore of the lake, as well as numerous smaller watercourses, entering from the north. It was also subject to backwater-flooding from the Red, Black, Ouachita, and Mississippi Rivers. In 1972, the Army Corps of Engineers constructed a diversion canal on the southeast shore of the lake to improve the ecological conditions resulting from the Corps' navigation project on the Ouachita and Black Rivers, in particular the Jonesville Lock Improvement. For this improvement, the Corps constructed a water control structure between the diversion canal and the lake that is manipulated to simulate natural conditions on the lake. The water control structure is essentially a pair of gates that can be raised or lowered to varying degrees to retain or raise the water level.

The State of Louisiana owns the lake bed and the Louisiana Department of Wildlife and Fisheries manages the resources of the lake. The Corps maintains the water control structures. Catahoula Refuge is responsible for water level management under a 1963 Memorandum of Understanding with the Corps, with two subsequent Amendments, and under a 1969 tri-party agreement among the Corps, the Department of Wildlife and Fisheries, and the Service. Water management activities are specified in a Water Management Plan and are for the benefit of migratory waterfowl as well as for wildlife-dependent recreation, including duck hunting and fishing (USCOE et al, 1969).

Under this Plan, on July 1 the refuge begins to gradually dewater the lake by allowing more water to flow out of the diversion structure on the lake and through the diversion canal to the Black River.

This drawdown encourages production for the fall migration of shorebirds and waterfowl. When the drawdown is complete, approximately 5,000 acres of shallow water is left in roughly the center of the lakebed. Production for waterfowl includes sedges, herbs, and grasses such as chufa (*Cyperus esculentus*), spikerush (*Eleocharis obtuse*), smartweed (*Polygonum*), pondweed (*Potamogeton*), sprangletop (*Leptochloa fascicularis*), Paspalum sp., teal grass (*Eragrostis hypnoides*), barnyard grass (*Echinochloa crus-galli*), Walter's millet (*Echinochloa walteri*), and duck potato or arrowhead (*Sagittaria latifolia*).

Two weeks before the state duck hunting season, which generally runs from mid-November through January, the refuge begins to raise the level of the lake by two feet to provide habitat for migratory waterfowl and for hunting opportunities including boat access. The refuge holds water in the lake by closing the water control structure.

After the waterfowl hunting season, the refuge raises the water level another 4.5 feet to enhance commercial fishing resources. Raising water levels after duck hunting season also helps minimize lead poisoning of ducks due to lead shot, which was used in the past for duck hunting. The water levels in late winter are managed towards late winter natural conditions, as much as possible. This includes allowing the free passage of fish through the diversion canal gates.

### **Invasive Plants**

Annual control of numerous invasive species, including Chinese tallow tree, American lotus, black willow, and Japanese climbing fern, is necessary on the refuge. Managing for moist-soil preferred plant species requires using a combination of approved herbicides, water control, and mechanical control, including discing and mowing, to control these invader species.

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## WILDLIFE

Catahoula Refuge was established on October 28, 1958, to provide extensive wintering habitat for migratory birds and waterfowl. It is one of the earliest such areas in central Louisiana acquired by the Government for conservation purposes, and today is home to 219 species of birds. There are 42 bird species nesting on the refuge.

The list in Appendix VII contains wildlife species that have been observed by refuge personnel, visiting ornithologists, and local birders, or are thought to occur on the refuge. Waterfowl, wading birds, raptors, and songbirds abound at various times of the year and one can observe them by driving the Wildlife Drive or hiking along levees, fields, or wooded roads.

### Waterfowl

The MAV is a critical ecoregion for migrating and wintering ducks and geese in North America (Reinecke et al., 1989). The MAV was selected as one of the wintering habitat focus areas. One of the first tasks faced by the LMVJV was to create a model or decision tool for determining how much habitat was needed and a way to relate this objective to the population goals of NAWMP. The solution was to view wintering areas as responsible for contributing to the spring breeding population goals of NAWMP proportional to the percentage of ducks historically counted in wintering areas (Loesch et al., 1994; Reinecke and Loesch 1996). To contribute ducks to spring populations, wintering areas have to provide sufficient habitat to ensure adequate winter survival. To quantify winter habitat requirements, the LMVJV had to identify limiting factors and it assumed foraging habitat was most likely to limit waterfowl populations in the MAV (Reinecke et al., 1989).

In simple terms, the objective of the LMVJV is to provide enough foraging habitat (in duck-use-days) for: (1) the continental duck population goal of NAWMP; (2) multiplied times the proportion of ducks typically wintering in the MAV area; (3) adjusted for ducks that die during winter but require habitat before they die; (4) multiplied by the average number of days ducks are present; and (5) multiplied by the amount of food required per duck per day. These calculations generate the need for millions of duck-days of foraging habitat value. Research indicates that foods used by mallards, pintails, wood ducks, and other species emphasized by NAWMP generally are obtained in three primary habitats: moist-soil areas, croplands, and forested wetlands. The ability of these habitats to provide duck-use-days of foraging habitat has been summarized (Reinecke et al., 1989; Loesch et al., 1994; Reinecke and Loesch 1996); this information is used by the LMVJV to calculate the acres of various combinations of habitat needed to satisfy population goals.

The process of relating habitat objectives for individual management areas to overall habitat objectives for the MAV involved several steps. First, habitat objectives were allocated among states relative to historic abundance of waterfowl. Then, knowledgeable managers within states determined strategies for meeting state habitat objectives by allocating percentages of the objectives to habitats with managed or naturally flooded water regimes and habitats on public or private lands. One result of this step-down process was to clearly define the collective habitat objectives of state and federal wildlife areas in the MAV relative to objectives of the LMVJV, which, in turn, were related to the NAWMP. The collective objectives of state and federal wildlife areas then were assigned to individual management areas based on waterfowl management capabilities.

Catahoula Refuge goals are to provide important foraging and resting habitats within the MAV for waterfowl and serve an integral role in NAWMP. The step-down objectives, originally expressed in acres that were established for Catahoula Refuge, are provided in Table 3. Duck-use-day objectives were calculated by multiplying the acreage objective by the assumed duck-use-day standard developed by the LMVJV for that habitat type. The acreage objective is more reflective of the originally established objective, but is not as descriptive as a duck-use-day objective. Complicating the reliability of the duck-use-day objective is the failure to include geese in the objective and the need for a review of the step-down process to further refine objectives based on more up-to-date information, a process that started in spring 2006 and should finish in 2007.

**Table 3. Catahoula National Wildlife Refuge Step-down and LMVJV Objectives**

	Objective (ac)	DUDs	Current Capabilities (ac)	DUDs
Bottomland forest	204	22,848	0	0
Moist-soil	425	589,050	293	405,634
<b>Total</b>	629	611,898	16,458	405,634

The LDWF conducts midwinter and monthly waterfowl population surveys of the Catahoula Lake area each year and the refuge assists the state in these surveys. Limited amounts of data are available for Catahoula National Wildlife Refuge. A breakdown of overall duck use by percent for December 2003, indicates that ring-necked duck (50 percent) was the largest user group, followed by green-winged teal (20 percent), wigeon (10 percent), mallard (10 percent), and pintail (10 percent).

Catahoula Refuge is designated as a Globally Important Bird Area for wintering and migrating waterfowl. Peak numbers of waterfowl occur in the area around December and January. The adjacent Catahoula Lake is also considered a Globally Important Bird Area with waterfowl population estimates ranging from 26,000 to 273,000 (2001-2002), which include, mallards, pintail, ring-necked duck, canvasback, wigeon, gadwall, green-winged teal, scaup, and northern shoveler.

Wood ducks reside all year and prefer the secluded forested wetlands, wooded and shrub swamps, and tree-lined bayous on the refuge. They reach their greatest population level on the refuge in the fall. In the Bushley Bayou Unit, the bottomland hardwood forest around Dempsey Lake provide excellent wood duck production habitat. Important wood duck habitat is also found around the many other shallow lakes within this unit, including Round Lake, Rhinehart Lake, Long Lake, and Black Lake.

### **Woodcock**

American Woodcock are migratory game birds that occur throughout the forested portions of the eastern United States. Woodcock populations in this region have declined 19 percent from 1968 to 1990. Population declines are thought to be the result of land use changes associated with land conversion and the maturing of forest habitats.

Wintering habitat includes moist bottomland hardwood forests with brush and understory, especially those in close association with agricultural fields and old field succession. These sites are typically wet thickets with a high density of plant stems with the ground open and clear. Typical cover includes privet, cane, and briars that result from openings in the canopy. The scrub/shrub and dense habitats

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found in certain portions of the refuge provide good daytime cover for woodcock. These habitats result from reforestation, old field succession, ice storms, and forest management practices, which also benefit priority forest interior nesting land birds (e.g., Swainson's warbler, Cerulean warbler, etc.), and other wildlife.

Woodcock have been observed around the edges of the refuge boundary and Catahoula Lake, as well as within the reforested areas of the Bushley Bayou Unit, especially at dusk.

### **Shorebirds and Wading Birds**

Shorebirds migrate through the MAV from the southernmost parts of South America to the northernmost part of North America. They typically probe in soft mud (mudflats) and shallow water for worms and small crustaceans. In the MAV these birds generally move through during spring and fall, foraging as they migrate. They may spend only ten days in the MAV. Few shorebirds overwinter or nest in the summer in the MAV. Habitat is generally more limited during their fall migration in the MAV than the spring.

Shorebirds can be found using the mudflats and shallow water areas of Duck Lake and its tailwaters and the impoundments within the Willow Lake Unit of the Headquarters Unit and the Minnow Ponds, Ducks Unlimited-Wetlands Reserve Program Ponds, Rhinehart Lake, Round Lake, and Long Lake located within the Bushley Bayou Unit. Shorebirds have been observed from spring to fall in these areas, but the highest use occurs as the lakes and impoundments are drawn down from July 1 through October 31.

Marsh birds, such as the Virginia and sora rails, use the moist-soil areas on the refuge during the fall and spring. Wading birds, such as great blue herons, snowy and cattle egrets, great egrets, tri-colored herons, glossy ibis, green herons, and white ibis, are abundant. They use the shoreline of Catahoula Lake and the nearby sloughs and flooded depressions.

### **Landbirds**

Many species of songbirds are experiencing long-term declines as a result of widespread habitat loss, particularly loss of bottomland hardwood forests and riparian woodlands, as well as early successional habitats such as grasslands and scrub habitats. The refuge has over 8,599 acres of mature bottomland hardwood forests and there are more than 13,868 acres of reforested habitat (currently scrub habitat) that will grow into a mature bottomland forest. A large variety of neotropical migratory birds are common in the refuge's different habitat types. Some common year-round residents include the Carolina chickadee, tufted titmouse, northern mocking bird, and red-winged blackbird. Yellow-bellied sapsuckers, white-eyed vireo, hermit thrush, yellow-rumped warbler and white-throated sparrow are some birds common in the winter. A bird list is available for Catahoula Refuge in Appendix VII.

The refuge has set aside about 95 acres on the Willow Lake Unit for grassland species that are declining in abundance in the MAV. This area, which is kept open by mowing, provides habitat for the dickcissel, LeConte's sparrow, and Henslow's sparrow.

Raptors frequent the fallow fields and reforested areas in search of rodents. Northern harrier, American kestrel, red-tailed hawk, and Cooper's hawk are some raptors observed on the refuge.

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## Threatened and Endangered Species

Bald eagles (*Haliaeetus leucocephalus*) have been seen wintering on the refuge for many years, although there are no known nesting sites. They visit the refuge during their migration through the area and are classified as transient. Louisiana black bear (*Ursus americanus luteolus*) habitat exists on the refuge and it is conceivable that a transient black bear may occur. With the recent discovery of an ivory-billed woodpecker (*Campephilus principalis*) at the Central Arkansas Refuge Complex, there is a possibility; however slight, that this refuge could provide some form of habitat now and in the future.

## Species of Concern

Ospreys, woodstorks, northern harriers, swallow-tail kites, and alligator snapping turtles are species of special concern occasionally reported in this area.

## Mammals

Mammals that are thought to occur on the refuge and are associated with bottomland hardwood forests include white-tailed deer, fox and gray squirrels, swamp and cottontail rabbits, armadillos, beaver, bobcat, coyote, opossum, and raccoon. Nutria, muskrat, mink, raccoon, opossum, beaver, and otter are the primary furbearers. Of these, the beaver, muskrat, river otter, nutria, and mink are associated with the more permanently inundated wetlands and riverine systems.

## Problem Wildlife

Beavers, raccoons, and feral hogs cause damage on the refuge. Beaver interfere with water management activities by clogging water control structures with debris. They can also cause flooding in reforested areas. Refuge staff controls beaver by trapping and shooting. USDA Wildlife Services has been contracted to remove beavers by trapping for the past three years on the Bushley Bayou Unit. Excessive numbers of raccoons can have negative effects on the reproduction of forest breeding birds and wild turkeys.

Feral hogs have been a problem on the Headquarters Unit for a number of years and are becoming an increasing problem on the Bushley Bayou Unit. There is a large amount of scientific evidence on the adverse effects of feral hogs on habitat productivity and on reproduction of native wildlife. They are omnivores, use virtually every component of the habitat, and are in direct competition with native wildlife, including deer. They root in the reforested areas, killing and eating seedlings, and can diminish regeneration in established hardwood forests because of their appetite for acorns. The feeding habit of hogs can disturb small, ground-dwelling mammals, amphibians, and reptiles. They also damage levees and roads. The refuge allows hunting of feral hogs as incidental to other regulated hunting.

## Reptiles and Amphibians

Amphibian management and conservation are of great interest due to apparent global amphibian declines. Habitat loss, fragmentation, and degradation appear to be the primary factors in declines. This group of animals requires quality wetland habitat for their survival and they also serve as important indicators of environmental health. Although no amphibian and reptile surveys have been conducted on Catahoula Refuge to determine species occurrence or population levels, lists of potential species, including frogs, turtles, and snakes, from some surveys in similar habitats are found in Appendix VII.

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## **Fish**

Impoundments and streams on the refuge are restocked during backwater flooding. Seasonal flooding of wooded areas provides a vast quantity of spawning and feeding habitat for numerous sport, commercial, and forage fishes. These species include largemouth bass, spotted bass, black crappie, white crappie, bluegill, redear sunfish, white bass, channel catfish, blue catfish, flathead catfish, alligator gar, largemouth and smallmouth buffalo, freshwater drum, and shad.

## **CULTURAL RESOURCES**

### **Historical Background**

This region of Louisiana has long been settled and used by humans, in good part because of its mild winters and abundant fish and wildlife resources. Local and regional archaeological resources have been identified from the Paleo-Indian and Meso-Indian era (2000 B.C. – 1600 A.D.). Although the first people entered what is now Mississippi about 12,000 years ago, the earliest major phase of earthen mound construction in this area did not begin until some 2,100 years ago. Mounds continued to be built sporadically for another 1,800 years. Of the mounds that remain today, some of the earliest were built to bury important members of local tribal groups. These mounds were usually rounded dome shapes. Later mounds were rectangular, flat-topped earthen platforms upon which temples or residences of chiefs were erected.

The Ancient Anilco, a state-recognized historic site, is an 80-foot tall Great Mound located in Jonesville, in Catahoula Parish. It was visited by Hernando De Soto in 1542 and was the site of a later battle between Spanish explorers and local Native Americans.

European settlement in LaSalle and Catahoula Parishes started with the Spanish in the 1760s. American settlement in the two parishes began in earnest in the earliest years of the 19<sup>th</sup> century when they were both part of Louisiana Territory's Rapides Parish.

The immediate vicinity of the present-day Catahoula Refuge was the location of numerous settler activities. Harrisonburg and Alexandria to the west were joined by a trail begun in 1800 as an overland trade route. The bluffs above Catahoula Lake (along its western shoreline) and the area along the north bank of the Little River were the location of several communities. A store developed at Rhinehart, just east of the Catahoula Lake as early as 1807. Eventually a trail from Natchez, Mississippi, into east Texas would cut through LaSalle Parish. By the 1820s and 1830s, much of the hill country of LaSalle and Catahoula Parishes was settled. By 1833, the White Sulphur Springs resort was offering healing waters, fishing on Trout Creek and the Little River, hiking, gambling, and a dance hall.

During the Civil War, Confederate soldiers built four forts to guard the Ouachita River. One of these, Fort Beauregard, located in Harrisonburg, survives and is a state historic site.

During the late 19th century, Urania became a center of the newly developing timber industry, which sought to exploit the stands of hardwoods such as cypress. By the early part of the 20th century, LaSalle Parish (created in 1910) and Catahoula Parish had experienced industrial expansion as the Louisiana and Arkansas Railroad cut through the region. Oil was discovered near Tullos in the 1920s. Currently, there is a federally recognized tribe, the Jena Band of Choctaws, located in LaSalle Parish. They do not currently own or live on a reservation (Jena Band of Choctaw Indians, No date; Online Highways, No Date; Encyclopedia Louisiana Online, No Date).

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## Cultural Resource Protection

Cultural resources include historic properties as defined in the National Historic Preservation Act (NHPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA), archaeological resources as defined in the Archaeological Resources Protection Act (ARPA), sacred sites as defined in Executive Order 13007, *Protection and Accommodation of Access To "Indian Sacred Sites,"* to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections. As defined by the NHPA, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), including any artifacts, records, and remains that are related to and located in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the NRHP as a result of their association with the cultural practices or beliefs of an American Indian tribe. Archaeological resources include any material of human life or activities that is at least 100 years old, and that is of archaeological interest.

Section 106 of the NHPA provides the framework for federal review and consideration of cultural resources during federal project planning and execution. The implementing regulations for the Section 106 process (36 CFR Part 800) have been promulgated by the Advisory Council on Historic Preservation (ACHP). The Secretary of the Interior maintains the NRHP and sets forth significance criteria (36 CFR Part 60) for inclusion in the register. Cultural resources may be considered "historic properties" for the purpose of consideration by a federal undertaking if they meet NRHP criteria. The implementing regulations at 36 CFR 800.16(v) define an undertaking as "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency." Historic properties are those that are formally placed in the NRHP by the Secretary of the Interior, and those that meet the criteria and are determined eligible for inclusion.

Like all federal agencies, the Service must abide by Section 106 of the NHPA. Cultural resources management in the Service is the responsibility of the regional director and is not delegated for the Section 106 process when historic properties could be affected by Service undertakings, for issuing archeological permits, and for Indian tribal involvement. The regional historic preservation officer (RHPO) advises the regional director about procedures, compliance, and implementation of the several cultural resources laws. The refuge manager assists the RHPO by informing the RHPO early about Service undertakings, by protecting archaeological sites and historic properties on lands managed and administered by the Service, by monitoring archaeological investigations by contractors and permittees, and by reporting violations.

The refuge follows these procedures to protect any cultural/historic legacy that may potentially occur on the refuge. Whenever construction work is undertaken that involves any excavation with heavy earth-moving equipment like tractors, graders, and bulldozers, such as for the development of moist-soil units, the refuge contracts with a qualified archaeologist/cultural resources expert to conduct an archaeological survey of the subject property. The results of this survey are submitted to the RHPO as well as the state historic preservation officer (SHPO), which in Louisiana is an archaeologist within the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development (Williams 2005; Bush 2005).

The SHPO reviews the surveys and determines whether cultural resources will be impacted, that is, whether any properties listed in or eligible or eligible for listing in the NRHP will be affected. If cultural resources are actually encountered during construction activities, the refuge is to notify the SHPO immediately.

To date, there have been two comprehensive archaeological surveys on the refuge; however, no properties have been determined to be eligible for the NRHP. Cultural resource surveys within the refuge have focused on the eastern shore area of Catahoula Lake (Wiseman et al., 1978; Boggess 1991). Given the region's settlement during both the prehistoric and historic periods, the likelihood of cultural resources is considered relatively high (Wiseman et al., 1978).

## **SOCIOECONOMIC ENVIRONMENT**

Seventy-three percent of the land area of the 25,000-acre refuge is located in Catahoula Parish; the remainder is in LaSalle Parish. These parishes are strategically situated in central Louisiana, in a region known as the crossroads of the state because of its location, which is convenient to all the major cities of Louisiana. The nearest major city is Alexandria (population 46,342), roughly 30 miles southeast of the refuge (USCB 2000).

The total population of Catahoula Parish was estimated at 10,615 in 2003 (USCB 2004). This estimate reflects a slight decline from the 10,920 people counted during the 2000 Census (USCB 2000). Neighboring LaSalle Parish, which contains only 30 percent of the refuge, has a slightly larger population of 14,179. Catahoula Parish has a median household income of \$22,528, as shown in Table 4. The percent of families below the poverty level, 22.6 percent, is higher than the state's average of 15.8 percent. Educational attainment measured by percentage of persons over 25 with high school diplomas or higher, is 62 percent in Catahoula Parish and 69 percent in LaSalle Parish, lower than the state's average of 74.8 percent. LaSalle Parish has a slightly higher median household income of \$28,189 and a lower poverty level (14.9 percent) than Catahoula Parish and the state.

**Table 4. Socioeconomic statistics for Catahoula and LaSalle Parishes**

	<b>Population (2003 Estimate)</b>	<b>Median household income</b>	<b>Percent below poverty level</b>	<b>Educational attainment (% with high school education)</b>	<b>Unemployment (March 2004)</b>
Catahoula	10,615	\$22,528	22.6%	62%	10.5%
LaSalle	14,179	\$28,189	14.9%	69%	7.4%
Louisiana	3.4 million	\$32,566	15.8%	74.8%	5.9%

*Source: BLS 2004; USCB 2000; USCB 2004*

Unemployment rates for both parishes tend to be higher than the state or national averages. In 2004, Catahoula Parish had 10.5 percent unemployment rate and LaSalle had 7.4 percent unemployment, compared to a state average of 5.9 percent and a national average of 5.7 percent (BLS 2004). Forestry dominates the local economic base and International Paper Company is a major employer. Other major industries for the parishes and the surrounding region include oil and gas services, apparel manufacturing, and agriculture. The leading field crops consist of sorghum (grain), soybeans, wheat, corn, and oats (NASS 2004).

Wildlife-dependent recreation includes fishing, hunting, and wildlife-watching activities. Wildlife-watching includes observing, photographing, and feeding fish and wildlife. The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USCB 2003) quantifies the economic impacts of these activities on a state level (Table 5).

**Table 5. Fishing, hunting, and wildlife-dependent recreation in Louisiana**

Activity	# of participants	Activity Days	Avg. days/participant	Total expenditures (\$1,000)	Trip-related expenditures (\$1,000)	Equipment and other (\$1,000)	Average \$/ participant	Average trip expenditure/day
Fishing	970,000	12,637,000	13	\$703,373	\$398,751	\$304,622	\$743	\$32
Hunting	333,000	6,442,000	19	\$446,204	\$120,668	\$325,536	\$1,120	\$19
Wildlife Watching	935,000	N/A	N/A	\$168,420	\$55,424	\$112,996	\$180	NA

Source: USCB. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

The survey estimates 970,000 people participated in fishing in the state, resulting in total expenditures of over \$700 million dollars. Wildlife watching attracted nearly as many participants, with 935,000 participants, but resulted in considerably less expenditure. Hunting resulted in \$446 million in total expenditures from its 333,000 participants. The total from all these activities, including trip-related expenses, equipment purchases, and licenses and services amounted to over \$1.3 billion in 2001 (USCB 2003).

## REFUGE ADMINISTRATION AND MANAGEMENT

### LAND PROTECTION AND CONSERVATION

The refuge now totals 25,242 acres, with a current approved acquisition boundary of 28,254 acres. The 6,671-acre Headquarters Unit borders nine miles of the northeast shore of Catahoula Lake, a 26,000-acre natural wetland renowned for its large concentrations of migratory waterfowl. The 18,571 acre Bushley Bayou Unit, located eight miles west of Jonesville in Catahoula Parish, was established in May 2001. The acquisition was made possible through a partnership agreement between The Conservation Fund, American Electric Power, and the Fish and Wildlife Service.

There are several parcels of land that lie within the existing refuge boundary that are not owned by the Service, totaling 3,012 acres. Several of these parcels compromise refuge management due to conflicting management purposes and disturbance to wildlife. Acquisition or exchange of these parcels would eliminate access issues, improve management options, and tighten some unclear and confusing boundary issues.

Refuge access by the public and staff members is also difficult on the Bushley Bayou Unit of the refuge. Expansion of the refuge boundary would greatly increase access by staff and the public and would further the refuge's mission to conserve, restore, and protect migratory birds and threatened and endangered species, especially migratory waterfowl, neotropical migratory birds, and possibly the threatened Louisiana black bear.

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## VISITOR SERVICES

Recreational visits to national wildlife refuges generate substantial economic activity. In fiscal year 2002, people visited refuges (in the lower 48 states) more than 35.5 million times for recreation and environmental education. Their spending generated \$809.2 million of sales in regional economies. As this spending flowed through the economy, nearly 19,000 people were employed and \$315.2 million in employment income was generated (Laughland and Caudill 2003).

The six priority uses of the refuge are fishing, hunting, wildlife observation, wildlife photography, and environmental education and interpretation.

The majority of public use occurs on the Headquarters Unit with some uses on the Bushley Bayou Unit (Figures 11 and 12). Facilities on the refuge include an auto tour route, boat ramps, foot trails, all-terrain vehicle trails, and an observation tower. There are three Service-owned boat ramps on the refuge on Duck Lake and Cowpen Bayou. The state also maintains a boat ramp on the French Fork of Little River at Catahoula Lake.

### **Fishing**

Fishing opportunities are offered year-round on Cowpen Bayou and the Highway 28 borrow pits of the Headquarters Unit. However, Muddy Bayou, Duck Lake, Willow Lake, the Highway 84 borrow pits, and all other refuge waters on the Headquarters Unit are opened to fishing from March 1 through October 31.

At the Bushley Bayou Unit, Dempsey Lake (30 acres) is a quality sportfishing lake. Bushley Bayou, which runs the entire length of the unit, offers additional sportfishing opportunities, especially during spring high water. Typical game species sought are bluegill, crappie, bass, and catfish. Several other lakes, such as Round Lake, Long Lake, and Rhinehart Lake, are too shallow to provide a year-round quality sport fishery; however, during periods of high water these lakes support good populations of catfish, carp, and buffalo. Crawfishing is also extremely popular in these lakes and other shallow water areas. Recreational fishing and crawfishing are allowed year-round on this unit.

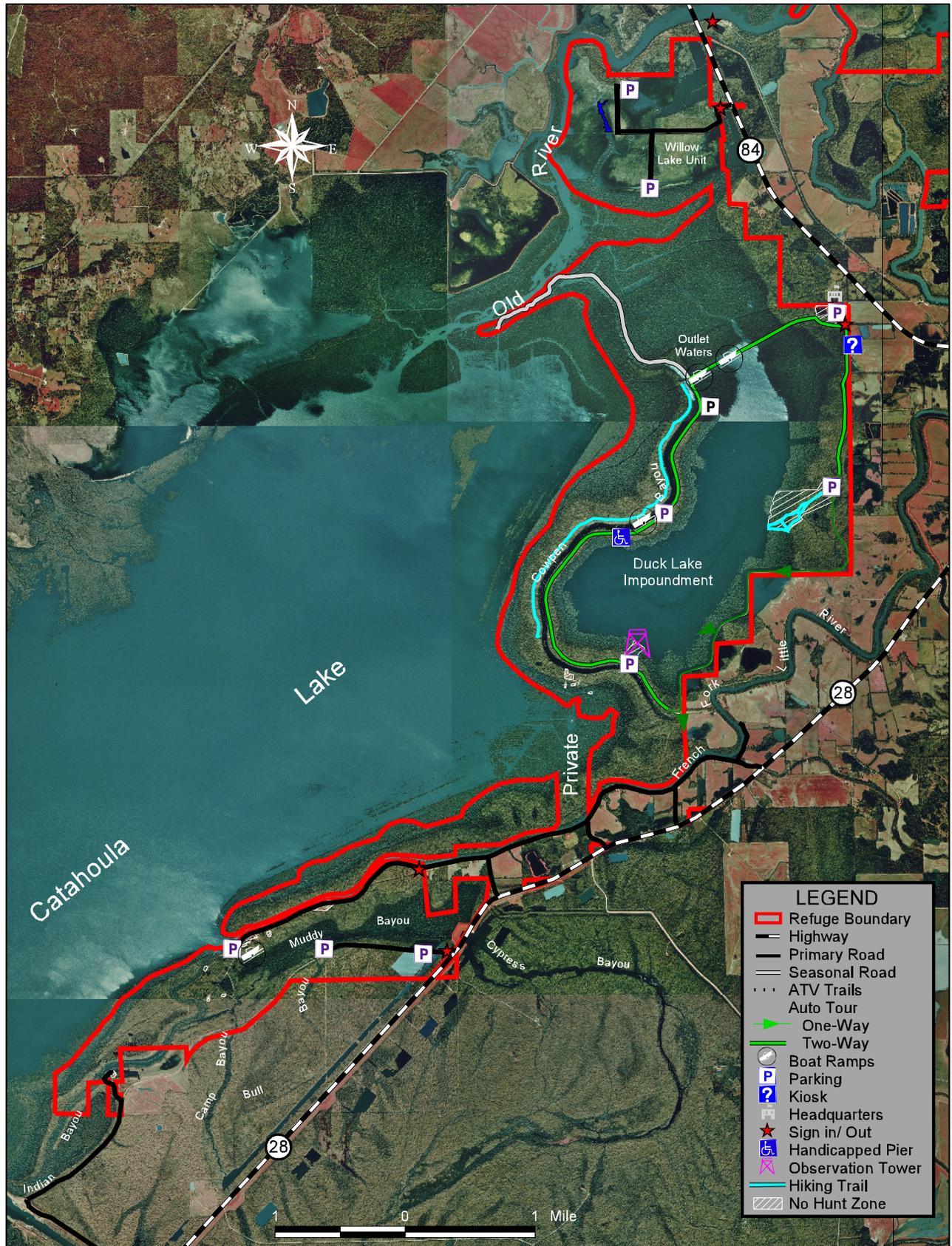
Motors of 10 horsepower or less are allowed on interior lakes within the Bushley Bayou Unit and on all Headquarters Unit waters. There is no horsepower limit on motors used on Bushley Creek, Big Bushley Creek, and Little Bushley Creek.

At the Bushley Bayou Unit, recreational gear (i.e., slat traps, wire nets, and hoop nets) is allowed only by refuge special use permits and only in Bushley Creek, Big Bushley Creek, and Little Bushley Creek.

Trotlines and yo-yos are only allowed on the Bushley Bayou Unit and have the following regulations. Trotlines must be tended at least once every 24 hours and reset when exposed by receding water levels, and must be attached with the length of cotton line that extends into the water. Trotlines must be removed when not in use. Yo-yos must be attended, and may be used during daylight hours only. Commercial fishing and commercial crawfishing are not allowed on refuge waters.

All fishing and hunting are in accordance with state regulations and require a valid state hunting or fishing license. In addition hunters and fishermen must comply with refuge regulations.

Figure 11. Visitor services on Catahoula National Wildlife Refuge Headquarters Unit





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All-terrain vehicles are allowed on designated refuge trails at the Bushley Bayou Unit. Some of these trails are open year-round for fishing and hunting access. The remainder, which does not lead to any fishing areas, is closed from March 1 through August 31.

## **Hunting**

Hunting is the next most popular recreational activity. Over 18,000 acres are open to hunting on the Bushley Bayou Unit and over 6,000 acres on the Headquarters Unit. On the Headquarters Unit the refuge holds a short small game season in October for rabbit and squirrel. Hunters are allowed to access the refuge two hours before official sunrise and are required to exit the refuge no later than two hours after official sunset. Hunters are allowed access to the Headquarters Unit for deer, squirrel, and rabbit hunting. The Bushley Bayou Unit is open to deer, squirrel, rabbit, rails, gallinule, snipe, woodcock, and waterfowl hunting. Archery hunting is open the entire state season. On the Bushley Unit, there are three big game hunts for deer, including 5 days of gun hunting, 7 days of muzzleloader hunting, and 100+ days of archery hunting. These hunts are non-quota and require only a signed refuge hunt regulation brochure, which is available at the refuge office, at sign-in stations located at most major entrances, and at some local hunting/fishing stores. Deer hunters are allowed to take only one deer per day and are not required to check them in. However, they must sign in and out for each hunt. Squirrels, rabbits, raccoons, and feral hogs may be taken during the archery hunt. Hogs and raccoons may be taken during all refuge hunts.

The state permits duck hunting on Catahoula Lake. The refuge allows duck hunting four days a week on Tuesdays, Thursdays, Saturdays, and Sundays until noon, during the state season only on the Bushley Bayou Unit, except in the 160-acre no-hunting zone in the minnow pond area. Other migratory bird hunting for woodcock, snipe, and rails is open during state seasons only on the Bushley Bayou Unit. Boats, decoys, and portable blinds must be removed at the end of each day. No permanent blinds are allowed. A youth waterfowl hunt in the East Zone is allowed until noon of the state youth waterfowl season. No waterfowl or migratory bird hunting is permitted on the Headquarters Unit. Hunters under the age of 16 must have completed a hunter education course and be accompanied by an adult 21 years of age or older. Hunting is in accordance with state regulations and requires a valid state hunting license.

## **Wildlife Observation and Photography**

There are many opportunities for wildlife viewing and photography on the refuge, which currently has two designated hiking trails, an observation tower, and a 9-mile wildlife auto drive on the Headquarters Unit. Other units provide more trails, roads, and diverse habitats.

The most popular facility on the refuge for wildlife observation is the observation tower, which overlooks a lake that draws a variety of waterfowl, shorebirds, wading birds, and raptors. The wildlife drive parallels Cowpen Bayou that provides a chance to see varied bird species, alligators, turtles, otters, and other wildlife. Much of the wildlife drive takes visitors through a bottomland hardwood forest where bobcat, white-tailed deer, and feral hogs can be seen. There is also some bird watching along the dirt roads on the Bushley Bayou Unit.

Although no photo blind is provided, visitors may use various haul roads to get into the woods or close to Duck Lake, which provides a close-up view of the birds using the refuge.

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## **Environmental Education and Interpretation**

Along the auto tour road on the Headquarters Unit, there are many opportunities to stop at the observation tower or to take a half-mile walk along the nature trail. There is an open-air kiosk with an interpretive display, which needs to be updated, on the Headquarters Unit. Most of the entrances to the refuge have hunter sign-in/sign-out boxes that include a kiosk with refuge information.

Environmental education programs are not available on-site because facilities do not allow for such programs. However, the refuge provides environmental programs for schools and community organizations when requested.

### *PERSONNEL, OPERATIONS, AND MAINTENANCE*

Catahoula Refuge includes four full-time staff members: the refuge manager, GS-0485-13; assistant refuge manager, GS-0485-11; office assistant, GS-0303-07; and engineering equipment operator, WG-5710-10.

The refuge has earth-moving, vegetation control, and water management machinery and equipment that is vital to pursuing its purpose. The equipment is kept at the maintenance compound, which is located on the Headquarters Unit. However, much of this equipment is outdated and in need of replacement.

The annual budget of the refuge varies, but has averaged \$271,000 over the past 5 years.

Access to the Bushley Bayou Unit is from State Highway 126, which runs through the northern portion of the refuge, from State Highway 8 on the western side of the refuge, and U.S. Highway 84 to the south. The only public access to the refuge lands that does not require crossing private land is by State Highway 126. Access to the Headquarters Unit is from Highway 28 and Highway 84.

There are 13.68 miles of gravel roads and 4.4 miles of dirt roads on the Headquarters Unit. There are roughly 7 miles of gravel roads, 5.65 miles of dirt roads, and 21.6 miles of all-terrain vehicle trails on the Bushley Bayou Unit.

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## *III. Plan Development*

### **PUBLIC INVOLVEMENT AND THE PLANNING PROCESS**

In accordance with Service guidelines and National Environmental Policy Act recommendations, public involvement has been a crucial factor throughout the development of the Draft Comprehensive Conservation Plan for Catahoula National Wildlife Refuge. This plan has been written with input and assistance from interested citizens, conservation organizations, and employees of local and state agencies. The participation of these stakeholders and their ideas has been of great value in setting the management direction for the refuge. The Service, as a whole, and the refuge staff, in particular, are very grateful to each one who has contributed time, expertise, and ideas to the planning process. The staff remains impressed by the passion and commitment of so many individuals for the lands and waters administered by the refuge.

Initial planning began in October 2004, with a pre-planning meeting of Service personnel. Early in the process of developing the draft plan the planning team identified a list of issues and concerns that were likely to be associated with the conservation and management of the refuge. Also, in preparation for developing the draft plan, a wildlife and habitat (biological) review was conducted on the refuge during the week of October 20-22, 2004, by a team of Service biologists, managers, foresters, and non-Service managers and biologists. A draft report for the biological review was completed in February 2005. A Visitor Services Review was completed in December 2004.

Public input to the development of the draft plan was initiated through a notice of intent published in the Federal Register on March 2, 2005 (70 FR 10109), and a public scoping meeting held on March 22, 2005. At the meeting interested stakeholders were able to register their concerns to ensure that they would be considered during the development of the draft plan.

### **SUMMARY OF ISSUES, CONCERNS AND OPPORTUNITIES**

The planning team identified a number of issues, concerns, and opportunities related to fish and wildlife population management, habitat management, resource protection, visitor services, and refuge administration. Key issues include invasive plants and nuisance animals, wintering waterfowl distribution and use of the refuge, breeding waterfowl, forest breeding birds, all-terrain vehicle use and access, and hunt programs. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. The team also directed the process of obtaining public input through a public scoping meeting, which was held on March 22, 2005, at the Jena Elementary School in Jena, Louisiana. The meeting was publicized by a press release in the local papers in Jena, Jonesville, and Alexandria (Chouinard 2005a).

There were 34 attendees at the meeting, and 7 meeting attendees provided public comment. Seven citizens sent comment letters to the refuge. The following is a summary of comments from the public scoping meeting and letters.

<p><b>Fish and Wildlife Population Management</b></p>	<ul style="list-style-type: none"> <li>• Provide better control of the beaver causing flooding on nearby lands and impacting timber.</li> <li>• Control the hog problem with an extended archery or small-caliber rifle season.</li> <li>• Introduce wild turkeys on the refuge.</li> <li>• Wintering waterfowl use and distribution.</li> </ul>
<p><b>Habitat Management</b></p>	<ul style="list-style-type: none"> <li>• Provide maintenance for water control structures and pump stations.</li> <li>• Provide canal maintenance.</li> </ul>
<p><b>Visitor Services</b></p>	<ul style="list-style-type: none"> <li>• Allow boats and gear to be left on the refuge within guidelines.</li> <li>• Ban shallow water drive motors, which disturb wildlife.</li> <li>• Prohibit hunting.</li> <li>• Allow hunting with dogs.</li> <li>• Allow deer hunters to leave their stands in place with time restrictions (4 comments).</li> <li>• Restrict vehicle access during hunting season.</li> <li>• Provide a youth hunt on Bushley Bayou Unit and a primitive hunt on the Headquarters Unit.</li> <li>• Allow duck and deer hunting on the same day.</li> <li>• Provide better access to the Bushley Bayou Unit by replacing the bridge.</li> <li>• Open the trail to Long Lake.</li> <li>• Bushhog the old road along the woods leading to Dempsey.</li> <li>• Allow horseback riding.</li> <li>• Allow more all-terrain vehicle access, especially near Long Lake and the new ponds, and keep trails open all year, not just for wildlife-dependent activities.</li> </ul>
<p><b>Refuge Administration</b></p>	<ul style="list-style-type: none"> <li>• Provide protection against trespassers, for wildlife, and against littering and dumping, as well as for hunting and fishing compliance checks.</li> <li>• Increase refuge staff.</li> </ul>

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All public and advisory team comments were considered; however, some issues important to the public fall outside the scope of the decision to be made within this planning process. The team has considered all issues that were raised through this planning process, and has developed a plan that attempts to balance the competing opinions regarding important issues. The team identified those issues that, in the team's best professional judgment, are most significant to the refuge. A summary of the significant issues follows.

## *FISH AND WILDLIFE POPULATION MANAGEMENT*

### **Nuisance and Invasive Species**

An "invasive species" is defined as a species that is (1) nonnative (or alien) to the ecosystem under consideration, and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Invasive species can be plants, animals, and other organisms (e.g., microbes). Deliberate or inadvertent human actions are the primary means of invasive species introductions.

Several nuisance and invasive species occur on the refuge. Some of the more prominent and obvious wildlife are nutria, beaver, and feral hogs. These species were either accidentally released and became acclimated to living in the wild, were intentionally released for sport or trade, or have expanded their range.

It is often necessary to monitor and sometimes necessary to control certain wildlife species, such as nutria, beaver, and feral hogs, to protect native habitats and wildlife in order to maintain healthy wildlife populations and to provide safety for visitors. Feral hogs have been sporadically controlled by allowing hunters to take them as incidentals.

A commenter would like to see beaver controlled on the refuge. Beaver, a resident wildlife species, has become a serious pest by building dams that hold water on trees, causing die-offs of mature bottomland hardwoods. Trapping could be allowed by special use permit, recreationally by refuge hunting permit, by USDA Wildlife Services, or by some other entity hired to trap the beaver in order to keep their population in check.

Some of these nuisance and invasive plants, including Chinese tallow tree and Japanese climbing fern, have been spreading extensively on the refuge, as has American lotus, which has at times covered Duck Lake, and the native black willow. These species are overtaking and displacing other native vegetation. Control of these nuisance and invasive plant species has been opportunistic and sporadic, using both herbicides and mowing.

### **Threatened and Endangered Species**

Recovery and protection of threatened and endangered plants and animals are important responsibilities delegated to the Service and its national wildlife refuges. Several federal threatened and endangered species are thought to use, or could use, Catahoula Refuge, including the bald eagle and the Louisiana black bear.

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## **Resident Wildlife**

While the Service's and the Refuge System's priority is the protection of federal trust species (e.g., migratory birds, threatened and endangered species, interjurisdictional fishes and marine mammals), the Refuge System's mission clearly states that refuges should also provide for other wildlife, such as resident species. In other words, by acquiring refuge lands, the Service also assumes responsibility for managing the resident wildlife that may be dependent on refuge resources, but not to the exclusion or detriment of the purpose for which the refuge was established. A variety of wildlife species indigenous to the MAV inhabit Catahoula Refuge. Some of the more notable are those easily seen by the general public, such as white-tailed deer and cottontail rabbits. Many of these species are also available to the public for hunting opportunities, which elevates their importance to the public and land managers.

A commenter suggested that another upland game species, wild turkey, be introduced on the refuge and possibly serve as brood stock for surrounding lands where they may be hunted.

## **Migratory Birds**

A major priority for the refuge is migratory birds. Providing high-quality wintering habitat that meets feeding, resting, and breeding needs of waterfowl guides a majority of the operation and management actions on the refuge. Providing undisturbed waterfowl sanctuaries while providing quality hunting opportunities is another significant issue.

Peak spring migration for shorebirds occurs from March to mid-May. Habitat for northbound shorebird migration seems to be sufficient with the possible exception of the Minnow Ponds on the Bushley Bayou Unit. Southbound fall migration starts in early July, peaks August through September, and tapers off toward winter, usually lasting until at least the end of October. Shallow-flooded or mudflat habitats in late summer and fall are critical for quality habitat. The already established management regime provides excellent habitat in copious amounts and existing shorebird management practices should be continued.

## **Forest Breeding Birds**

Neotropical migratory birds are of special management concern. The biological review results outlined that the current condition of the mature forest on the refuge is mid-successional and considered to be of poor quality for most priority songbirds. The refuge will need to work toward opening the canopy to develop vertical and horizontal structure in the mature forest and maintaining vertical and horizontal diversity in the Bushley Bayou Unit as the forests mature to improve habitat for forest breeding birds.

## *HABITAT MANAGEMENT*

### **Bottomland Hardwood Forest**

The refuge is situated within the physiographic region known as the Mississippi Alluvial Valley. This valley was once a 25-million-acre forested wetland complex that extended along both sides of the Mississippi River from Illinois to southern Louisiana. The extent and duration of annual flooding from the Mississippi River fluctuated annually and served to recharge aquatic systems, creating rich, dynamic habitats that supported a vast array of fish and wildlife resources.

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As civilization pushed westward, the highest, least flood-prone lands were cleared and converted to rich farmland. With success in agriculture and an expanding human population, more land was being cleared and additional flood control measures were implemented. Today, this valley is dissected by levees and a myriad of flood control projects and supports less than five million acres of bottomland hardwood forests. The fish and wildlife resources have mirrored the decline in the forest.

Although reforestation is the obvious “fix” for the vast forests that have been converted to row-crop agriculture, it must always be remembered that hydrology (i.e., flooding) drives the ecological system in the valley. It is imperative that managers remember that reforestation is only part of the solution. Restoring or mimicking a natural hydrologic cycle in conjunction with reforestation is needed.

Large areas have been reforested on the refuge. Currently, there are 8,599 acres of maturing bottomland hardwood forest and 13,868 acres of reforestation. The refuge will continue to manage and enhance these areas with the goal of providing a diverse habitat for waterfowl, neotropical migratory birds, and resident wildlife species.

## *RESOURCE PROTECTION*

### **Pollution Prevention**

There were ongoing oil and gas operations on the refuge when it was established in 1958. While the federal government owns the surface rights, private parties own the sub-surface mineral rights. State law allows these private owners to use usual and customary methods to access those minerals. These methods include establishing road beds, well head and tank farm pads, and pipeline rights-of-way through the refuge. These activities typically have, as a part of their operations, characteristics that are not compatible with refuge purposes, such as noise and wildlife disturbance and harassment. In addition, operations are also often associated with oil spills; dust/erosion/hydrological alteration/loss of habitat from oil field roads; loss of habitat; erosion on pipeline rights-of-way; and air, water, soil, sediment, and biota pollution.

Refuge management needs to work with operators to remedy risks of spills, as well as to reduce noise, air, soil, and water pollution from oil and gas operations on the refuge. The refuge needs to monitor operations on the refuge and incorporate the special use permit system into all phases of oil and gas management where possible. Special permit conditions should allow clear communications to operators concerning refuge requirements and should serve as references in the event of future disputes. Special permit conditions should also establish a fair and uniform set of rules for all refuge oil and gas operators.

### **Refuge Expansion Needs**

There are several parcels of land that lie within the existing refuge boundary that are not owned by the Service. Several of these compromise refuge management due to conflicting management purposes and disturbance to wildlife. Refuge access by the public and staff members is also difficult on the Bushley Bayou Unit of the refuge.

The refuge plans to work with “inholding” landowners to acquire or exchange lands that would eliminate unwanted access across the refuge and improve access for employees and the public. Acquisition or exchange of these parcels would eliminate access issues, improve management options, and resolve some unclear and confusing boundary issues. In addition, expansion of the refuge boundary within 10 percent of the current acquisition boundary would also greatly increase refuge access.

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## **Cultural Resources**

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. The National Historic Preservation Act of 1966 and its Section 104 have a particular bearing on all federal agencies. 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 is to be accomplished through a mix of informed management, law enforcement efforts, and public education; and (4) There is an increasing role for consultation with groups, such as Native American tribes, to address how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups.

Refuge management needs to conduct a comprehensive archaeological survey of all refuge lands and develop a Geographic Information System (GIS) layer on the archaeological and historic sites for use in planning. In addition, the refuge should seek to develop a partnership with the Jena Band of Choctaw Indians for interpreting the significance of refuge sites to Native Americans and the general public.

### *VISITOR SERVICES*

#### **Priority Public Use**

The National Wildlife Refuge System Improvement Act of 1997 has established six priority public uses on refuge lands when they are compatible and desirable for that specific refuge. These priority uses are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

#### **Hunting and Fishing**

As expressed in the public scoping meeting, hunting and fishing opportunities on the refuge are of great public interest. Public comments expressed interest in enhancing hunting opportunities by holding special youth hunts and by providing youth hunt blinds in the Minnow Ponds on the Bushley Bayou Unit. Other comments included providing for handicap-accessible hunts, a three-day weekend hunt, not closing the waterfowl season during the gun hunt for deer on the Bushley Bayou Unit, and allowing hunters to leave gear in the field during the hunting season.

Most waterways within the refuge have been altered, allowing natural stocking of desirable gamefish into these waters only during periods of high water. In addition, sedimentation, contaminants, and access have been some of the issues hindering the development of a quality fishing program. Concerns about mercury contamination were discussed at the public scoping meeting. The refuge will continue to work with the state to monitor the situation and to post public health advisories on fish consumption when needed.

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Some commenters would like to see fishing opportunities at the refuge maintained and expanded by improving the fishery on Willow Lake, Duck Lake, and Cowpen Bayou. Others would like the refuge to consider not closing fishing on the Bushley Bayou Unit during deer gun season and improving crawfishing on the Minnow Ponds.

To improve refuge access to the public for these priority uses, both to and within the refuge, commenters expressed a desire for a new boat ramp on Rhinehart Lake, for more clearly marked trails for hunting and hiking, and for clearing new trails.

Use of all-terrain vehicles on the refuge is limited. These vehicles are allowed on designated refuge trails at the Bushley Bayou Unit. Some of these trails are open year-round for fishing or hunting access. Some commenters would like the refuge to consider some all-terrain vehicle use during deer season and use for visitors who are 59 and over to make it easier to retrieve downed animals. Comments were also received on allowing horseback riding on the refuge.

### **Wildlife Observation and Photography/Environmental Education and Interpretation**

The refuge's visitor services program has focused on "traditional" recreational uses, primarily hunting and fishing, as well as wildlife observation and wildlife photography. Due to limited staff, there has been less emphasis on interpretive and educational activities. The refuge wants to continue to expand its visitor services to include emphasis on these historically "non-traditional" uses (e.g., wildlife observation, wildlife photography, and environmental education and interpretation) without alienating the more "traditional" visitors.

Currently, there is an observation tower on the Headquarters Unit, which provides opportunities for viewing wildlife, including waterfowl, shorebirds, wading birds, and raptors. At times, the number and variety of these birds create a spectacular sight. There are a number of opportunities for expanding wildlife observation and photography, including the development of additional trails.

### *REFUGE ADMINISTRATION*

#### **Funding and Staffing**

Biological and public use review teams, as well as the public, identified a need for additional staff. The biological review identifies a need to add seven positions in order to adequately manage its waterfowl, habitat, public use, and law enforcement objectives.

#### **Wilderness**

The wilderness review is a required component of the comprehensive conservation plan.

The Wilderness Act defines a wilderness area as an area of federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is managed so as to preserve its natural conditions and which:

1. generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
2. has outstanding opportunities for solitude or primitive and unconfined type of recreation;
3. has at least 5,000 contiguous roadless acres or is of sufficient size to make practicable its preservation and use in an unimpaired condition;

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4. does not substantially exhibit the effects of logging, farming, grazing, or other extensive development or alteration of the landscape, or its wilderness character could be restored through appropriate management, at the time of review;
  5. is a roadless island; and
  6. may contain ecological, geological, or other features of scientific, education, scenic, or historic value.

There are no designated wilderness areas on Catahoula Refuge.

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## *IV. Management Direction*

### **INTRODUCTION**

The Service manages fish and wildlife habitats and considers the needs of all resources in decision-making. But first and foremost, fish and wildlife conservation assumes priority in refuge management. A requirement of the National Wildlife Refuge System Improvement Act of 1997 is for the Service to maintain the ecological health, diversity, and integrity of refuges. Public uses are allowed if they are appropriate and compatible with wildlife and habitat conservation. The Service has identified the following six priority wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. These uses are therefore emphasized in this plan.

Described below is the proposed comprehensive conservation plan for managing the refuge over the next 15 years. This proposed management direction contains the goals, objectives, and strategies that would be used to achieve the refuge vision.

Three alternatives for managing the refuge were considered: Alternative A (No Action Alternative), Alternative B (the proposed alternative), and Alternative C (No Management). Each of these alternatives is described in the Alternatives section of the Environmental Assessment. The Service chose Alternative B as the proposed management direction.

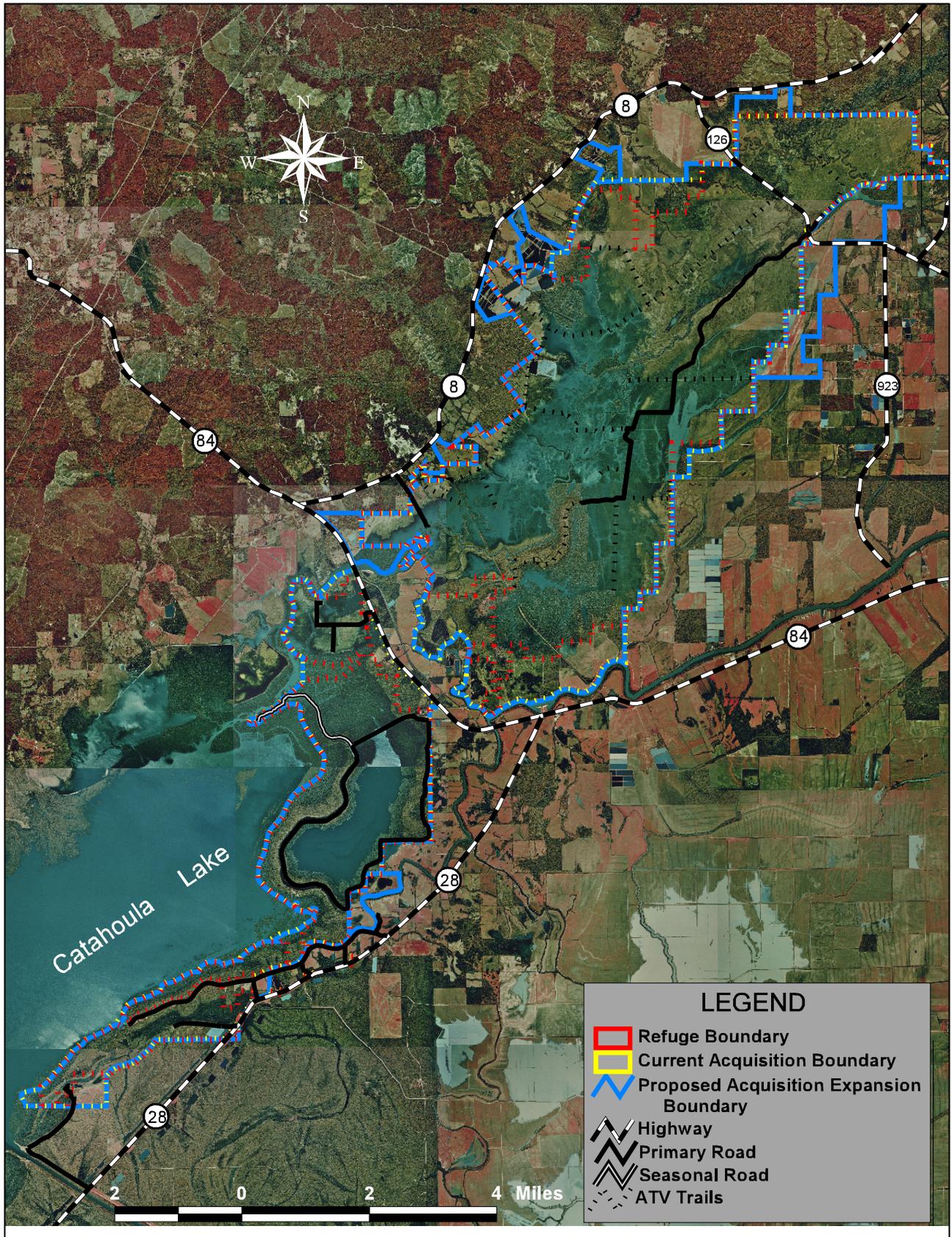
Under Alternative B, management efforts would focus on achieving the refuge's primary purposes and would also provide greater enhancement and management of habitats and associated plant communities for the greater benefit of wildlife. Extensive wildlife and plant census and inventory activities would be initiated to obtain the biological information needed to implement management programs on the refuge. The refuge would improve migratory waterfowl habitat, the wood duck nest box program, habitat to support breeding pairs of wading birds, and migration habitat for southbound and northbound shorebirds.

Habitat management activities would focus on providing healthy bottomland hardwood forests, moist-soil units, and grasslands needed to achieve wildlife population objectives. Forested habitat would be managed to promote and maintain structural and plant species diversity and support key species of migratory and resident species, moist-soil quality would increase, and habitat for grassland birds would be improved. A summary of the current acreages by habitat type can be found in Chapter II of the draft plan.

The refuge would inventory and more aggressively monitor, control, and, where possible, eliminate invasive plants and focus the control of nuisance wildlife on those having the greatest negative impact on native habitat and wildlife and would include trapping and control of furbearing species.

An archaeological survey to identify potential cultural resources would help in planning for land protection. The refuge would work closely with partners to acquire or exchange lands with willing inholding landowners and to expand the current acquisition boundary by 2,824 acres in order to improve access for refuge staff and the public and to increase wildlife benefits (Figure 13).

Figure 13. Proposed acquisition expansion boundary on Catahoula National Wildlife Refuge



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The refuge would continue to work with the state and production operators to identify and eliminate potential spill risks from oil and gas activities, continue the special use permit system, and provide monitoring for first alert in spill events. In addition, as a step towards reducing pollution, refuge staff would work with the Service's Division of Ecological Services to establish protocols for baseline air, soil, and water contamination, and to better determine the source of contaminants, such as pesticides and mercury.

Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation opportunities would be improved (Figures 14 and 15). Youth hunts, handicap/youth accessible blinds, improved access for bank fishing, addition of a new observation tower, and supporting environmental-based curricula in the local schools are some of the improvements planned under Alternative B. In addition, the current office facility would be expanded to accommodate an environmental education and an interpretive display.

Additional staff would include a biologist, forester, assistant manager, maintenance worker, park ranger (law enforcement officer), engineering equipment operator, and a park ranger (interpretive) to accomplish objectives for establishing baseline data on refuge resources, managing habitats, and for adequate protection of wildlife and visitors.

Implementing the proposed alternative would result in well-organized, long-term management plans for improving refuge resources for wildlife, while providing additional opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. This alternative would also provide the law enforcement protection needed to meet the refuge purposes.

## **VISION**

Catahoula National Wildlife Refuge will provide habitat for wintering waterfowl and other migratory birds through management of bottomland hardwood forests and moist-soil habitats. Management of these habitats will enhance protection of endangered species and increase wildlife diversity. The refuge will manage fish and wildlife resources to enhance public use opportunities while working in partnership with others.

## **GOALS, OBJECTIVES, AND STRATEGIES**

The goals, objectives, and strategies presented are the Service's response to the issues, concerns, and needs expressed by the planning team, the refuge staff and partners, and the public and are presented in hierarchical format. Chapter V, Plan Implementation, identifies the projects associated with the various strategies.

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, and the purposes and vision of Catahoula National Wildlife Refuge. The Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

**Figure 14. Current and proposed visitor facilities on Catahoula National Wildlife Refuge Headquarters Unit**

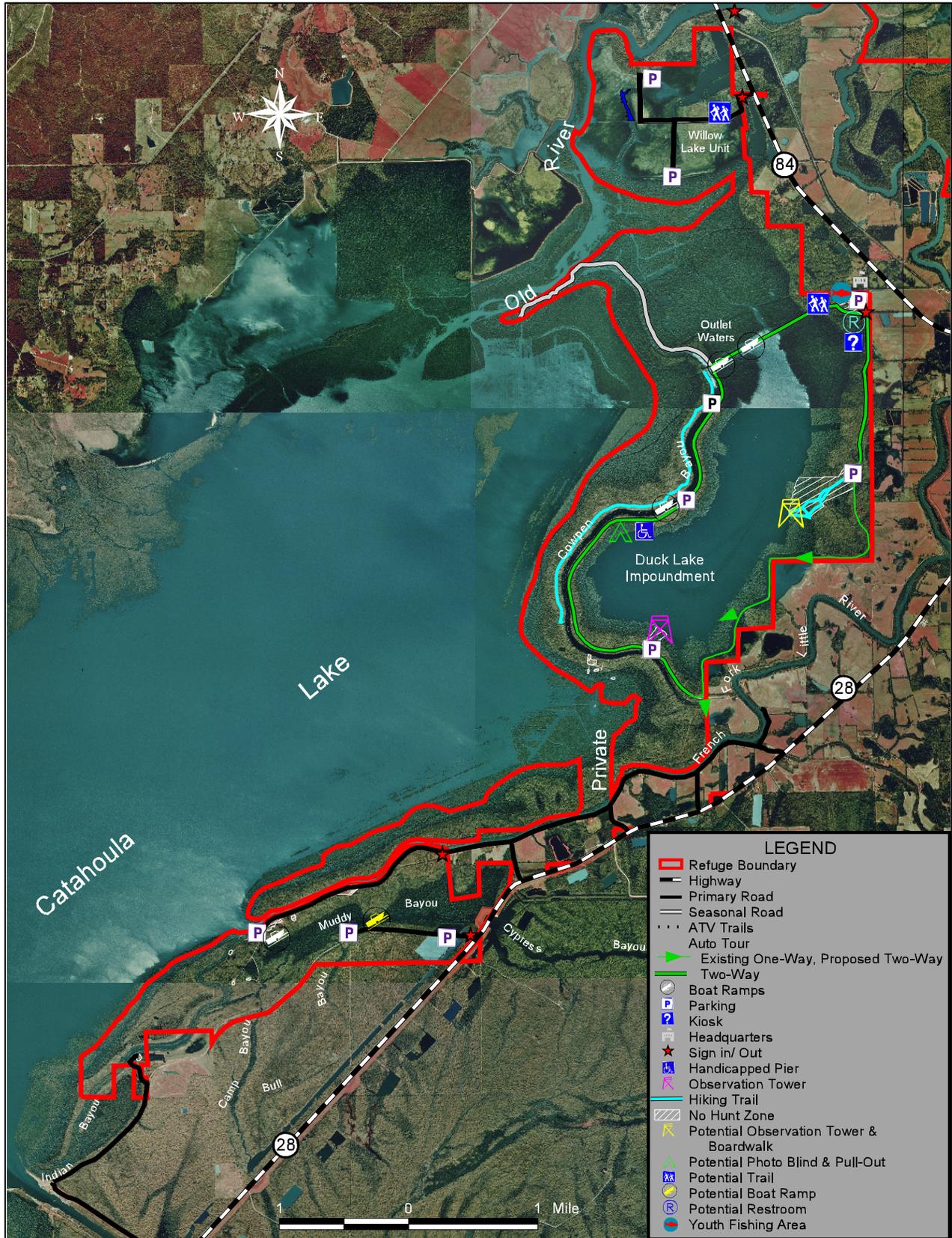
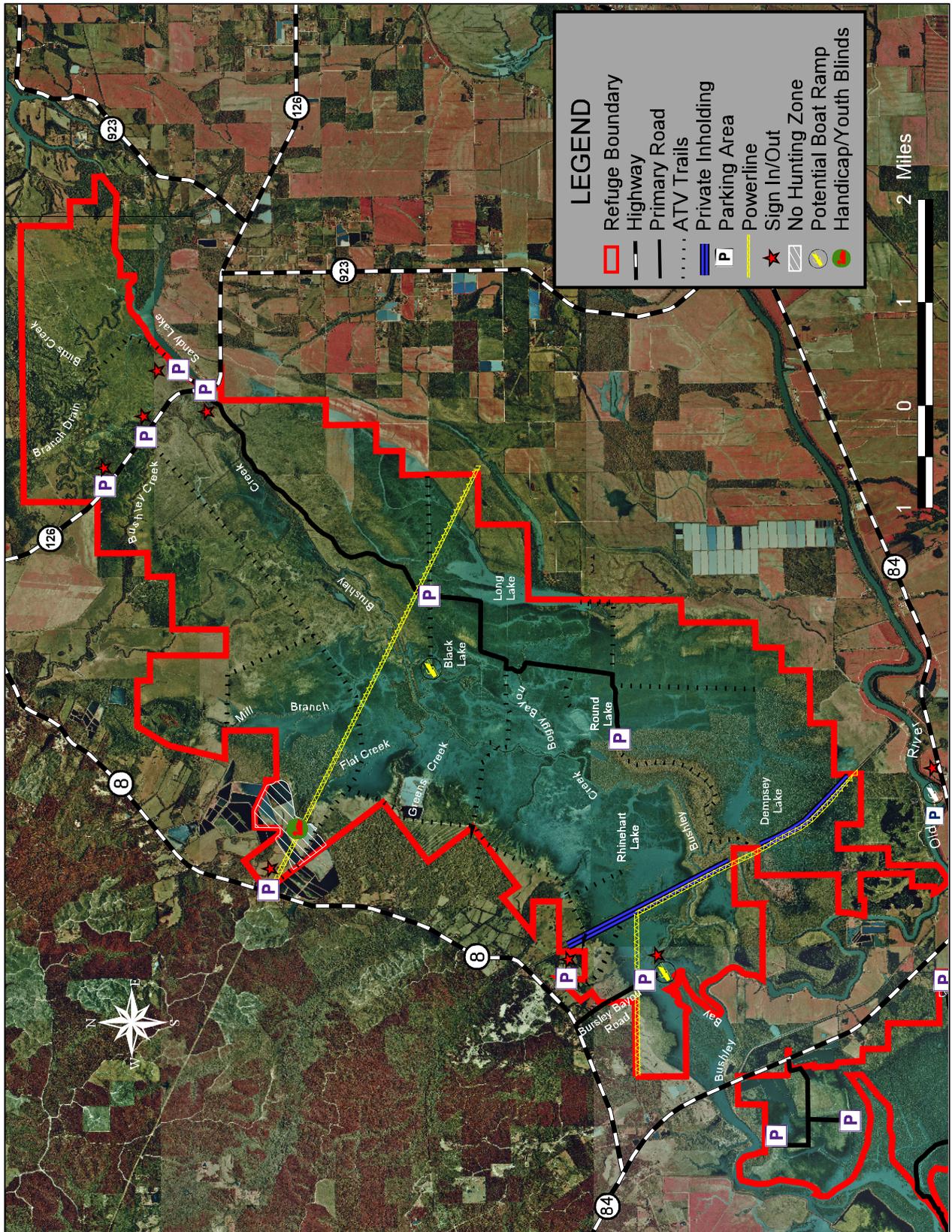


Figure 15. Current and proposed visitor facilities on Catahoula National Wildlife Refuge Bushley Bayou Unit



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## FISH AND WILDLIFE POPULATION MANAGEMENT

### **Goal 1: Conserve, restore, and enhance the ecological diversity and abundance of migratory birds and other indigenous fish and wildlife.**

*Background:* The primary purpose of the refuge is to serve as a wintering area for migratory waterfowl. Refuge lands include bottomland hardwood forests, reforested areas, cypress sloughs, moist-soil units, and open fields and grassland areas, which provide feeding, nesting, and loafing habitat for thousands of wintering ducks and geese and nesting habitat for wood ducks. Non-game waterbirds using the refuge include shorebirds, wading birds, and marshbirds, as well as a large variety of neotropical migratory birds. In addition many species of mammals, fish, and other wildlife use these areas.

Recovery and protection of threatened and endangered plants and animals are important responsibilities delegated to the Service and its national wildlife refuges. Several federal threatened and endangered species are thought to use, or could use, the refuge lands, including the Louisiana black bear, the bald eagle, and the ivory-billed woodpecker.

While the Service and the Refuge System's priority is the protection of federal trust species (e.g., migratory birds, threatened and endangered species, interjurisdictional fish and marine mammals), this mission clearly states that refuges should also provide for other wildlife, such as resident species, although never to the exclusion or detriment of the purpose for which the refuge was established.

A variety of wildlife indigenous to the MAV inhabits the refuge. Some of the more notable wildlife is those easily seen by the general public, such as white-tailed deer and cottontail rabbits. The refuge sport fisheries and crawfish populations provide sustainable recreational fishing opportunities.

*Objective 1-1: Wintering Waterfowl.* Support the North American Waterfowl Management Plan (NAWMP) and Lower Mississippi Valley Joint Venture (LMVJV) step-down objectives by providing habitat in the waterfowl sanctuary and moist-soil areas.

*Discussion:* The refuge is located in the western edge of the MAV, which is a critical ecoregion for migrating and wintering dabbling ducks, wood ducks, and geese in North America (Reinecke et al., 1989), as well as southern breeding populations of wood ducks.

Flooded cropland is an important component of wintering waterfowl habitat because agricultural seeds provide high amounts of energy (i.e., hot foods) for waterfowl. While flooded cropland can be a valuable habitat source for high-energy foods, waterfowl satisfy many of their needs for protein by foraging on aquatic invertebrates in natural wetlands.

Two natural wetland habitats that ducks have historically used in the MAV are bottomland hardwood forests and moist-soil habitats (i.e., early successional grass, sedge, and other herbaceous vegetated wetlands). Both bottomland hardwood forests and moist-soil habitats are rich in high-energy natural seeds (e.g., acorns, grass and sedge seeds, roots, and tubers in moist-soil areas) and aquatic invertebrates. Indeed, wintering waterfowl satisfied their nutritional and other physiological needs in these wetlands before large-scale conversion of the MAV to agriculture.

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Working under the direction of the NAWMP, the LMVJV strives to provide habitat for over-wintering waterfowl in the MAV and West Gulf Coastal Plain Bird Conservation Regions. Based on a “step-down” process, the LMVJV established habitat objectives for dabbling ducks that link continental waterfowl populations to on-the-ground habitat objectives. Habitat objectives are apportioned among three categories: public managed; private managed; and naturally flooded lands within each state (in the LMVJV administrative boundaries). Each national wildlife refuge is responsible for contributing to some portion of the habitat objectives. This step-down process has been completed for the MAV and for the West Gulf Coastal Plain. The objectives are currently under review and will be updated due to additional information and research results related to data used in the step-down process.

*Strategies:*

- Devise and Implement a Biological Inventory/Monitoring Plan by 2009, which includes refuge-specific waterfowl inventory and monitoring protocols, standardized routes, and computerized databases.
- Continue and improve water management activities on Catahoula Lake as described in the tri-party agreement with the Army Corps of Engineers and Louisiana Department of Wildlife and Fisheries (USCOE et al., 1969).
- Maintain waterfowl sanctuary and improve moist-soil areas on both the Headquarters and Bushley Bayou Units.

*Objective 1-2: Nesting/Resident Waterfowl.* Provide 100 wood duck nesting boxes and conduct banding activities to support objectives of the Mississippi Flyway Council.

*Discussion:* Wood ducks are year-round residents in the forest lands of the United States, including the refuge. Preferred habitats include forested wetlands, wooded and shrub swamps, tree-lined rivers, streams, sloughs, and beaver ponds. Wood ducks seek food in the form of acorns, other soft and hard mast, weed seeds, and invertebrates found in shallow flooded timber, shrub swamps, and along stream banks. They loaf and roost in more secluded areas and dense shrub swamps.

Wood ducks are cavity nesters, seeking cavities in trees within a mile of water. Brood survival is higher when nests are close to water. Urban sprawl, agriculture, forestry practices, and competition for nest sites from a host of other species cause reproduction to be limited because of the lack of natural cavities. As a result, nest boxes are commonly used to supplement natural cavities and increase local production of wood ducks. Nest boxes require cleaning and repair at least annually. Wood duck production can be increased by more frequent checks and cleaning, but this must be weighed with other time constraints. Box checks are conducted prior to and after the nest season at a minimum, and checks during the nest season are typically conducted to better estimate the number of broods, nest success, and productivity. The refuge currently has 123 wood duck boxes with an 85 percent use rate.

A recent publication, *Increasing Wood Duck Productivity: Guidelines for Management and Banding on USFWS Refuge Lands* (Southeast Region) (USFWS 2003), provides guidelines for the use of wood duck nest boxes that should be used to guide the nest box program at the refuge

Because wood ducks are fairly secretive birds, it is extremely difficult to estimate populations and survival rates. Therefore, regional banding quotas, which are stepped down to individual states and stations to distribute banding throughout the range of the wood duck, have been established to determine harvest and survival rates. The refuge has an annual preseason banding quota of 100 wood ducks, including 13 adult males, 22 adult females, 27 immature males, and 38 immature females. The refuge has a history of reaching its banding quota and it is essential that this practice continue so that this important resource can be managed.

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*Strategies:*

- Maintain and monitor a minimum of 100 wood duck nest boxes following Increasing Wood Duck Productivity: Guidelines for Management and Banding.
- Continue to meet or exceed the pre-season wood duck banding quota of 100 wood ducks, by age and sex.

*Objective 1-3: American Woodcock.* Develop and implement forest management plans that provide moist mid-story and groundstory vegetation (i.e., thickets) in the forested lands for daytime cover and foraging habitat in moist grassland habitats for nighttime foraging by American woodcock to significantly contribute to the American Woodcock Management Plan (USFWS 1990).

*Discussion:* Woodcock are migratory game birds that occur throughout the forested portions of the eastern United States. Nationally, woodcock have decreased for the past decade and are still below flyway goals. Hunting seasons have become more restrictive, but a majority of biologists feel that the key limiting factor is habitat (primarily breeding but also high-quality migration and wintering). Wintering habitat includes moist bottomland hardwood forests with brush and understory, especially when found in close association with agricultural fields.

In 1990, the American Woodcock Management Plan was completed, setting an objective to protect and enhance wintering and migration habitat on public lands to increase woodcock carrying capacity. The plan also set objectives to inventory and monitor woodcock habitat and develop management demonstration areas.

Forest conditions on the refuge are generally characterized by a closed canopy with little to no ground or mid-story. Bushley Bayou Unit reforested areas currently provide fairly high-quality nocturnal habitat, which will degrade as the trees mature. Willow Lake, a 95-acre old field, definitely has the potential to be nocturnal habitat for woodcock, but likely needs a fire or some other disturbance to provide an open ground layer.

*Strategies:*

- Inventory suitable woodcock wintering habitat, monitor abundance, and coordinate with LDWF to implement banding or other important monitoring methodologies.
- Develop a Habitat Management Plan, which includes improving diurnal habitat, particularly on ridges, with forest management activities.
- Promote warm-season grasses and incorporate burning to provide an open ground layer on the Willow Lake Field for woodcock.

*Objective 1-4: Marshbirds.* Provide emergent vegetation for breeding marshbirds by 2008.

*Discussion:* Most of the recommendations for waterbirds other than waterfowl are derived from the Mississippi Alluvial Valley Shorebird Conservation Plan (Wilson et al., 2000) and a draft of the Southeast U.S. Waterbird Conservation Plan (Hunter and Golder, In prep.).

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While it is likely that yellow rail (and possibly black rail) occur at the refuge, they would be in early stages of reforestation, which is readily available at the present time across the valley. All the other priority marshbirds that could be found at the refuge require tall emergent vegetation as part of their habitat. All are breeding species, except American bittern. Breeding populations of pied-billed grebe and American coot are considered of regional conservation interest, even though wintering populations are considered secure. Of the marshbirds of greatest conservation interest, king rail is of highest concern, followed by least bittern and purple gallinule.

The Minnow Ponds on the Bushley Bayou Unit presently support about 150 acres of tall emergent marsh. The possibility exists for more habitat along the moist-soil units in Duck Lake depending on drawdown schedules. Most areas are drawn down at about the same time in early July, which is probably too late to support nesting king rails, least bitterns, or purple gallinules, and given priorities, this is not likely to change. Extensive spraying of American lotus may limit the availability of habitat during late summer.

Most waterfowl-oriented management, especially for wintering populations, is geared away from promoting tall emergent vegetation. Tall emergent vegetation, including cattail, big bulrush, and other species, can be aggressive and take over impoundments without careful control. However, the number of species that require tall emergent vegetation (and the apparent severity of king rail decline) suggests that some degree of middle ground is required to cover the needs of both waterfowl and priority marshbirds.

Opportunities to identify potential sites for marshbird management would be in the Minnow Ponds on the Bushley Bayou Unit. Such focus will require maintaining micro-topography within the impoundments (no laser leveling of any kind). Opportunity may exist along sloughs, also on the Bushley Bayou Unit, where shallow but more permanent water, with low incidence of fluctuations during breeding season, are needed. Where there is good wood duck brooding habitat there should be opportunity to support more tall emergent wetlands, but this will be a long-term process.

Integrating the needs of breeding marshbirds in with wood duck brooding habitat and other wintering waterfowl habitat requirements is an important recommendation from review teams, as is conducting spot checks using call-back protocols to determine if these smaller patches are used by king rail and least bittern during the breeding season.

*Strategies:*

- Focus specific attention to promoting tall emergent vegetation in a way that would support a sizeable breeding king rail (i.e., 50 pairs or more) and least bittern populations spread across the refuge by 2020.
- Spot-check habitat patches to determine use by priority species. Especially focus survey efforts at the Minnow Ponds, using marshbird call-back survey points and contribute to ongoing secretive marshbird survey data.
- Initiate marshbird surveys to establish baseline data and monitor use of managed sites targeting breeding rails, bitterns, grebes, gallinules, and coots. This will aid in the management of the preferred habitats for these species.
- Track incidental use of impoundments by marshbirds during shorebird surveys.

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*Objective -1-5: Long-Legged Waders.* Provide for both secure nesting sites and ample foraging habitat by 2010.

*Discussion:* Generally, there is plenty of habitat available for nesting long-legged wading birds. However, the key to protecting this species is consideration of how much disturbance these nesting birds can tolerate.

Species of conservation interest in the MAV include little blue heron, tricolored heron, yellow-crowned night-heron, wood stork, and white ibis. Daily observations of these species, their numbers, use of impoundments, and the condition and management of these impoundments would provide valuable information for guiding management decisions, again in line with what is needed for brood rearing wood duck and later use by migrating and wintering waterfowl.

*Strategies:*

- Locate nesting sites for colonial waterbird species each year and determine if special measures are needed to reduce disturbance.
- Determine incidental use of managed wetlands and lake beds during post-breeding periods by long-legged waders, concurrently with southbound shorebird surveys.

*Objective 1-6: Shorebirds.* Provide for both northbound and especially southbound shorebird foraging sites, by 2010.

*Discussion:* Where opportunities exist, refuge management of shorebird habitat should be focused on both northbound and southbound movement periods. It is clear that a combination of Catahoula Lake and the refuge (i.e., Duck Lake Impoundment) is critically important for southbound and northbound migratory birds in the MAV. With emphasis on southbound migratory birds (when habitat is generally unavailable in most areas), the currently established regime of initiating gradual drawdowns from early July through to early October provides excellent habitat in copious amounts. Additional habitat for northbound migratory shorebirds can possibly be provided in the Minnow Ponds on the Bushley Bayou Unit in concert with other management priorities (e.g., marshbirds and waterfowl). Coordination and use of established protocols to monitor shorebird use of actively managed wetlands are essential.

Present LMVJV step-down objectives for the refuge call for 200 acres during southbound migration. Northbound migration habitat should be made available in concert with moist-soil management for waterfowl.

For southbound migration, specific measures need to be employed for shorebirds. There are generally two peaks: one for adults in July and early-August and one for juveniles from September to late-October. One approach would be to hold water in some impoundments into July and then gradually draw down. Flooding other impoundments will be necessary for drawing down water in August and September. September habitat would overlap needs of southbound migrating blue-winged teal and northern pintail.

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*Strategies:*

- Continue to draw down water from early July through October at Duck Lake Impoundment and see if opportunity exists to provide northbound habitat from late-March to late-May on other areas of the refuge.
- Continue to support LMVJV Shorebird Survey protocol and conduct regular surveys using International Shorebird Survey (ISS) protocol in coordination with the South Atlantic Migratory Bird Initiative.

*Objective 1-7: Grassland Birds.* Provide 95 acres of native grassland-dominated habitat in the Willow Lake Unit to support priority grassland birds by 2009.

*Discussion:* The Willow Lake Unit currently supports a field of 95 acres maintained specifically to provide habitat for wintering grassland species. Priority grassland species such as Henslow's and LeConte's sparrows, northern harriers, and possibly short-eared owls have been seen. When MAV grassland bird objectives are established, the refuge will consider the importance of this site in contribution towards these objectives.

*Strategies:*

- Work with NRCS on an experimental process for the establishment of warm-season native grasslands.
- Conduct grassland bird surveys to determine species use and abundance during winter and breeding seasons.

*Objective 1-8: Forestbirds.* Work with partners in the Saline source population objective area (SPOA) to contribute to the creation of a 20,000-acre forest block to provide sufficient habitat to support 500 breeding pairs of both Swainson's and prothonotary warblers, as well as other high priority species in the PIF bird conservation plan (Twedt et al., 1999).

*Discussion:* The refuge presently supports 8,599 acres of mature forested wetlands on Headquarters and Bushley Bayou Units. In addition, 13,868 acres have been reforested within the last ten years on the Refuge. The Saline SPOA is one of the few areas that the forest patch objective has been met.

Much of the presently mature forest is in mid-successional (e.g., densely stocked, low vertical, and horizontal structure) condition, which is generally considered poor for most priority songbirds. Refuge management will work towards opening the canopy through thinning and where appropriate, patch cuts to develop vertical and horizontal structure. Wetter areas will require larger openings to provide for this condition; however, it is the drier areas that will be most important for supporting breeding habitat for understory species requiring cover, including Swainson's warbler, Kentucky warbler, and wood thrush, as well as diurnal habitat for American woodcock.

Substantial planning will be required for maintaining vertical and horizontal diversity in the Bushley Bayou Unit as forests mature there during the next 20 years in order to avoid having uniform mid-successional conditions across this unit.

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*Strategies:*

- Survey refuge and determine baseline populations for neotropical migratory birds.
- Establish point-count stations to determine species response to management.
- Work in conjunction with state wildlife management areas, universities, and other federal refuges to monitor productivity and survival.

*Objective 1-9: Threatened and Endangered Species.* Provide for secure nesting and roosting sites for bald eagles and support ivory-billed woodpecker recovery efforts.

*Discussion:* The bald eagle is listed as a federally threatened species and the Southeast Regional Management Guidelines should be followed where nests are established until national guidelines are established.

The ivory-billed woodpecker has been recently rediscovered in the MAV and efforts are underway to establish recovery plans. The refuge will have an opportunity to work with local, state, federal, and non-governmental entities to contribute to this species recovery.

*Strategies:*

- Implement the most current approved Bald Eagle Management Guidelines around any known nest or roost sites when discovered.
- Work with local, state, federal, and non-governmental entities to support recovery efforts for ivory-billed woodpeckers.

*Objective 1-10: Threatened and Endangered Species.* Continue to provide habitat to support Louisiana black bear recovery efforts.

*Discussion:* The reasons for listing the Louisiana black bear (*Ursus americanus luteolus*) as a threatened species under the Endangered Species Act were habitat reduction and declining populations. Bears once occurred throughout southern Mississippi, Louisiana, and eastern Texas. Habitat modification, particularly clearing for agriculture, has reduced suitable habitat by more than 80 percent. Good black bear habitat consists of diverse forests with stable and varied food supplies, suitable denning sites, and escape cover with minimal human contact.

Due to the lack of any documented breeding population near the refuge, management priorities for the black bear in the near term are not high priority. With repatriation efforts ongoing to the southeast on Lake Ophelia Refuge and Red River/Three Rivers Wildlife Management Areas, management will stay up-to-date on bear movements associated with these activities. Bears could possibly move through the refuge or actually take up residence, which would change priorities in regard to bears.

*Strategies:*

- Participate on the Louisiana Black Bear Committee and keep up-to-date on research activities associated with repatriation efforts. Document sightings of bears on the refuge and the surrounding area.
- Timber management promoting diversity, while providing a hard mast component and retaining den trees on the refuge, will improve habitat conditions for bears.

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*Objective 1-11: Mammals-Wildlife Diversity/Resident Wildlife.* Maintain and develop diversified habitats and promote management actions that will support healthy populations of endemic wildlife species such as deer and rabbits.

*Discussion:* The refuge supports a variety of habitats typical of central Louisiana and, consequently, hosts the full range of wildlife species common to the area. The refuge is managing for hardwood diversity and a healthy mast-producing stand with the goal of having positive impacts on resident mammal populations. Continued attention and periodic inventories and surveys will allow managers to continue to manage forest resources for resident wildlife.

Whitetailed-deer are the largest mammals on the refuge and are well adapted to the habitats found there. Ordinarily, healthy animals can tolerate the endemic parasites and diseases. However, in situations where the deer population exceeds carrying capacity, deer can have a major impact on the habitat, resulting in such poor condition for the entire herd that parasites and diseases affect the deer's health, potentially controlling the numbers of deer found there annually. Unfortunately, when deer have adversely impacted their habitat, it often takes years for the habitat and the herd to recover, with the result that the population is subject to broad swings in numbers over time (i.e., a "boom and bust" situation).

Deer numbers should be reduced annually to minimize both the impact on the habitat and problems caused by parasites/diseases within the deer herds. With no predators controlling deer population, hunting provides recreational opportunity and is the preferred method to control the deer population.

Turkey establishment is possible with the help of LDWF. These birds may be able to serve as brood stock for surrounding lands, where they may be hunted, but they would be protected on the refuge. Hydrology, quantity, and quality of turkey habitat on the refuge should be evaluated.

Two species of rabbits, cottontail and swamp, are found on the refuge in abundance. Even though many predators prey on these rabbits, population numbers are thought to be high and at carrying capacity. 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 underutilized species.

*Strategies:*

- Maintain a diversity of wetland and non-wetland habitats that support healthy populations of resident wildlife.
- Continue to use hunting as a tool to manage wildlife populations where it is compatible with other refuge purposes and activities.
- Initiate browse survey working with LDWF to determine deer population index. Continue to conduct spotlight surveys or other surveys to estimate deer densities and buck-to-doe-to-fawn ratios.
- Coordinate with the state on other resident wildlife issues, such as turkey establishment.

*Objective 1-12: Invasive Nuisance Species.* Control certain wildlife and plant populations, especially predators, exotics, and invasive species, as needed, to achieve habitat and population objectives that will provide healthy populations of native wildlife and their ecosystem.

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*Discussion:* In some situations, it is necessary to monitor and control populations of selected wildlife species in order to protect and benefit native habitats and other wildlife, maintain healthy wildlife populations, and provide for the safety of visitors. Wild pigs are a feral species that cause significant damage to wetlands and habitat. Nutria are exotic herbivores that can cause significant damage to marsh habitats when populations become elevated, an event referred to as an “eat out.” Nutria are such a problem damaging habitat and levees in some areas that the State of Louisiana has begun administering a new program to pay an incentive payment for each nutria killed. Beavers can plug water control structures, making water management for waterfowl impoundments and farming operations difficult.

*Strategies:*

- Monitor and control the beaver, nutria, and raccoon populations to keep numbers under control and minimize habitat impacts on refuge and adjacent lands caused by elevated populations.
- Conduct furbearer scent station surveys and general observation surveys to get baseline index on predator numbers.
- Monitor and control feral hog populations to keep numbers under control and minimize habitat impacts caused by this species.
- Monitor and control invasive nuisance plant species. Develop strategies for control in association with habitat management plans.

*Objective 1-13: Amphibians and Reptiles.* Encourage research and partnering with cooperators to assess species occurrence and habitat associations of amphibians and reptiles on the refuge.

*Discussion:* Amphibians and reptiles are experiencing worldwide population declines (Collins and Storer 2003; Gibbons et al., 2000) and there is an urgent need to develop strategies for managing and conserving these two taxonomic groups. An essential step in this process is to inventory federal lands to determine which species occupy a given area, and to characterize the habitat occupied by amphibians and reptiles so that suitable habitat may be restored, enhanced, and sustained.

Most amphibians occupy both aquatic and terrestrial habitats at various points in their complex life cycle; many reptiles utilize both types of habitat as well. Thus, management plans for these two taxonomic groups need to address the aquatic habitat needs of totally aquatic amphibians and reptiles, as well as the requirements for successful larval growth and metamorphosis of amphibians.

As a group, amphibians have generally attracted more attention than have reptiles, because of the recent plethora of well-documented cases of their decline around the world. The terrestrial environment is vital habitat both for completely terrestrial amphibians (e.g., some lungless salamanders of the family Plethodontidae), as well as for species that breed in aquatic sites, the adults of which live in the surrounding terrestrial habitat within 200 m during the nonbreeding season (Madison 1997; Semlitsch 1998). Studies indicate that many terrestrial caudate amphibians (e.g., salamanders) are best adapted to conditions associated with late stages of forest succession (deMaynadier and Hunter, 1995). Thus, many amphibians are sensitive to intensive forestry practices, such as clear-cutting, that eliminates shading and leaf litter, thus increasing soil surface temperature and reducing leaf litter moisture (Petranka 1998). Several studies demonstrate that salamander populations, in particular, either decline following clear-cutting or are less abundant in young stands than in mature forest stands (Petranka 1998).

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For pond-breeding amphibians, recent studies have demonstrated that the extent of canopy cover over breeding ponds (Skelly et al., 2002; Halverson et al., 2003) and the composition of leaf litter in the pond basin (Rubbo and Kiesecker 2004) may play a strong role in the distribution and abundance of some species. These studies underscore the potentially important influence of the structure and composition of vegetation in the terrestrial environment on the successful reproduction and recruitment of amphibians in the aquatic habitat. Such factors (e.g., canopy closure and forest composition) may therefore be important to consider in management plans designed to promote amphibian diversity. However, these studies need to be replicated in the southeastern United States, using native vegetation and amphibians, to determine whether similar trends might exist in our region.

At a broader level, Semlitsch (Semlitsch 2000) outlined three critical factors that need to be considered in a management plan for amphibians, all related to the ecological connectivity of amphibian metapopulations. These are: (1) the number or density of individuals dispersing from individual wetlands; (2) the diversity of wetlands with regard to hydroperiod (length of time a water body retains water); and (3) the probability of dispersal among adjacent wetlands or the rescue and recolonization of local populations. The effects of these activities need to be considered in designing an effective management plan for amphibians.

### *Strategies*

- Conduct amphibian and reptile surveys using a diversity of methods to quantify key characteristics of both terrestrial and aquatic habitat (e.g., the hydroperiod of aquatic sites; canopy closure, vegetational structure, and composition of terrestrial habitat surrounding aquatic sites).
- Examine possible effects of anthropogenic activities (e.g., oil and gas activity; contamination from lead and herbicides) on species diversity and richness of amphibians and reptiles in coordination with the research community.

*Objective 1-14: Fisheries.* Enhance 500-1,000 acres of fish habitat and maintain self-sustaining sport fish and crawfish populations through management, monitoring, and law enforcement.

*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 Fisheries and Aquatic Resources Strategic Plan for the Southeast Region is a Service management document promulgated in 1997. The plan, reviewed by the refuge program prior to dispersal, recognizes fisheries and aquatic resource management as important Service activities both on and off refuges and lists several goals in pursuit of these endeavors. Goal 5 of this plan directs the Service to “Provide for sustainable recreational fishing opportunities in the Southeast adequate to meet public needs.” Objective F under this goal states, “Provide and maintain recreational fishing opportunities on FWS lands” and lists several tasks in conjunction with this pursuit, including “establish new recreational fishing opportunities...,” “increase access to recreational fishing sites on and across FWS lands,” and “develop methods for integrated management of migratory bird populations, other animals and plants, and recreational fisheries on FWS lands.”

The recently formed Southeast Aquatic Resources Partnership, modeled after the North American Waterfowl Management Plan, is comprised of 16 states, the Fish and Wildlife Service, the National Marine Fisheries Service, Coastal Commissions and Councils, and others. The group commitment is “Working cooperatively we can attain the desired goals of healthy and diverse aquatic ecosystems that support sustainable public use.” Under the six key focus areas, first listed is public use with the intent to “Increase recreational fishing and other sustainable uses of aquatic resources by the public.”

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Based on the plans described above, the refuge will enhance measures for sport fish and the red swamp crawfish, *Procambarus clarkia*. The focus for fish will be providing adequate water level, which protects against summer and winter temperature extremes and retards excessive rooted plant populations. Excessive rooted plants rob nutrients from an algal-based fish food web, contribute to oxygen depletions, and encumber effective bass predation.

*Strategies:*

- Provide water depths of 6 feet or more to maintain sport fish populations in Duck Lake, Cowpen Bayou, and impoundments and lakes in the remainder of the refuge during the summertime.
- Monitor fish populations using of a variety of methods to determine survival in relation to management actions.
- By 2010, manage one or more of the Bushley Bayou Unit ponds to improve crawfishery.

**HABITAT MANAGEMENT**

**Goal 2: Restore, manage, and enhance the functions and values associated with diverse bottomland hardwood forest, open wetlands, and grassland habitats in order to achieve refuge purposes and wildlife population objectives.**

*Background:* About 80 percent of the forest lands in the MAV have been cleared and converted to other land uses, leaving only remnant forested tracts. Fish and wildlife resources have been seriously impacted, leaving remnant populations that must be managed to meet the refuge's purpose and to achieve the maximum potential. To address this issue, reforestation has been the refuge's major forest management activity. Wetlands are valuable loafing and feeding habitat for wintering waterfowl and the refuge grasslands provide habitat for priority grassland species.

*Objective 2-1: Bottomland Hardwood Forest.* Provide a diverse bottomland hardwood forest to meet the various needs of many wildlife species, including waterfowl, neotropical migratory birds, and resident species.

*Discussion:* Currently, the refuge consists of approximately 8,599 acres of maturing bottomland hardwood forest and 13,868 acres of reforestation. Of the 8,599 acres of maturing bottomland hardwood forest, 3,399 acres are located in the Bushley Bayou Unit and 5,200 acres are located in the Headquarters Unit. Forest management on the refuge should be rotated between the two management units to spread habitat improvements throughout the refuge and not concentrate them in a given unit or area.

Forest conditions on the Headquarters Unit can be broken down as follows:

- Maturing bottomland hardwood forest = 3,200 acres
- Swamp privet-dominated shrub-scrub = 2,000 acres
- Reforestation = 464 acres

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There has been very little forest management activity conducted on the Headquarters Unit since its original purchase in 1958. In the 1980s, a Forest Management Plan was written for this area, but was only partially implemented due to staffing constraints. Lack of consistent forest management activity on this unit has led to the development of many forest timber stands into single canopy conditions with limited mid-story and understory layers. To improve habitat conditions, the refuge will adopt forest management activities that open the forest canopy and allow sunlight to reach the forest floor to stimulate development of understory and mid-story vegetation. General *Guidelines for Hardwood Forest Management to Improve Wildlife Habitat*, written by Fish and Wildlife Service and Geological Survey personnel in 2003, will be used to guide forest management actions.

In general, the long-term objective of management activities is to improve forest habitat for priority bird species by developing a structurally diverse forest in terms of species, size class, and growth forms (e.g., trees, shrubs, vines, and forbs) within a heterogeneous forest canopy. Additionally, to support the needs of wildlife that are dependent on hard mast (e.g., black bear, squirrels, and turkey), regeneration of shade-intolerant tree species (e.g., oaks) must be ensured.

To meet these objectives, general guidelines for timber harvest should include a combination of thinning, cutting small groups of trees (<1 acre), and harvesting patches between 1 and 3 acres. This harvest strategy is intended to (1) release remaining trees for development of canopies and dominant trees that will eventually become super-emergent trees; (2) encourage development of ground and mid-story structure; and (3) increase the amount of light reaching the forest floor in areas large enough to support regeneration of shade-intolerant tree species.

The 2,000 acres of swamp privet-dominated shrub-scrub offers a different challenge for forest management. This habitat type has an abundant mid-story dominated by swamp privet, with little overstory and understory. To encourage overstory development, openings should be created, mechanically or chemically, in the privet and seedlings of desired tree species planted in the openings.

Reforested areas on the Headquarters Unit are too young for management at this time, except the 40-acre area that was planted in 1976. This 40-acre reforestation area should be considered part of the maturing bottomland hardwood forest area. The biggest management concern for these other reforestation areas will be maintaining firebreaks to prevent wildfires from damaging the young trees.

Forest conditions on the Bushley Bayou Unit can be broken down as follows:

- Maturing Bottomland Hardwood Forest = 3,399 acres
- Reforestation = 13,404 acres

Acquisition of the unit was not completed until 2001. Thus, timber management activities were under private control. Recommendations for management of this unit should follow the recommendations given for the Headquarters Unit.

*Strategies:*

- Perform a forest inventory to assess forest and habitat conditions found on the refuge.
- Develop a Forest Management Plan to include dividing the refuge into management compartments and managing a rotation schedule and monitoring system to assess management activities.

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*Objective 2-2: Open Wetland Habitats.* Provide and monitor quality moist-soil habitat to meet Louisiana step-down objectives and maintain waterfowl sanctuary.

*Discussion:* Duck Lake provides a valuable refuge for wintering waterfowl that also use the adjacent Catahoula Lake and area agricultural lands. Most of these areas have intense hunting (gun) pressure, and the Refuge provides quality loafing and feeding habitat. Refuge managers should continue to keep this lake as a protected place and to manage the present available acreage for moist-soil habitats. Preventing further encroachment of woody vegetation along the lake perimeter also should be a goal, along with continuing ground surveys of waterfowl and monitoring of disease outbreaks.

*Strategies:*

- Continue to manage and monitor the moist-soil areas in Duck Lake for the production of moist-soil plants (e.g., sprangletop) by continuing to control lotus, preventing further encroachment of woody vegetation along the lake perimeter, and maintaining a 3-year mowing/discing schedule.
- Until foraging habitat goals are “re-calculated” by the LMVJV, continue to maintain moist-soil areas as they are at present. If more acreage is deemed necessary, additional subdivision of Duck Lake could be reevaluated or more intensive management of Minnow Ponds on Bushley Bayou Unit could be incorporated.
- Maintain summer pool stage in Duck Lake to ensure early water on the refuge.
- Drill water wells or engineer alternate water source on Bushley Bayou Minnow Ponds. Although not critical for intensive moist-soil management, these sources will still provide waterfowl benefits while being managed specifically for crawfish, wading birds, and shorebirds.
- Cooperate with Louisiana Department of Wildlife and Fisheries and the LMVJV Office to assess the feasibility of a more comprehensive/coordinated survey and inventory of waterfowl in the West Gulf Coast Plain Joint Venture and LMVJV area.
- Develop water management plan for moist-soil areas to include monitoring and management to better ensure sites have good food production.
- Using established protocol, monitor disease outbreaks, especially when high numbers of waterfowl concentrate in the refuge.
- Maintain and monitor current sanctuary to not exceed waterfowl disturbance thresholds that could significantly impact refuge sanctuary/loafing availability during key wintering periods.

*Objective 2-3: Grasslands.* Provide 95 acres of grass-dominated habitat in the Willow Lake Unit for supporting priority grassland birds by 2009.

*Discussion:* Willow Lake Unit presently supports a field of 95 acres maintained specifically to provide habitat for wintering grassland species. As mentioned previously in this section, in the future, when MAV grassland bird objectives are established, the refuge management will consider the importance of this site in contribution towards these objectives.

*Strategies:*

- Develop habitat management plan for this unit. Consider splitting up the unit into thirds for establishing a disturbance schedule on a 3-year cycle but with understanding of the distribution within the field of priority species.
- Pursue opportunities to establish warm-season native grasses working with the Natural Resources Conservation Service.

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## RESOURCE PROTECTION

### **Goal 3: Conserve natural and cultural resources through partnerships, protection, and land acquisition programs.**

*Background:* Over 90 percent of the land in the MAV is privately owned, making private land a critical part of any landscape conservation initiative. The Service can provide technical and financial assistance to private landowners interested in protecting, restoring, or managing fish and wildlife habitats on their property. In addition, purchase of lands within the refuge acquisition boundary is critical to the achievement of the refuge vision.

The Service often uses conservation tools (i.e., conservation easements, partnership agreements, and technical assistance) to protect, restore, manage, and acquire high-priority habitats within this area. These priorities consider the existing threats to these habitats, their linkages to other protected habitats, the value of these habitats to trust species, their accessibility, and their potential in providing opportunities for wildlife-dependent environmental education and recreation. Refuge staff also can help deliver land protection and conservation assistance in concert with other federal, state, and private agencies. Providing assistance to private landowners is a critical element in achieving the landscape habitat initiatives in the MAV.

*Objective 3-1: Land Protection.* Work with adjacent landowners to enhance and restore habitat for migratory waterfowl and neotropical migratory birds through hydrology restoration and reforestation. Contact landowners every five years to determine interest in cost-share assistance programs.

*Discussion:* The vast majority of land in the MAV is privately owned. Due to loss of habitat and forest fragmentation, refuges and state lands are isolated by large acreages that have been converted to row-crop agriculture and provide little or no habitat for species of concern. The cooperation of private landowners in restoring habitat adjacent to the refuge maximizes the land base available to migratory birds and helps ensure the success of national and regional plans, such as the North American Waterfowl Management Plan, Partners in Flight, Lower Mississippi River Ecosystem Plan, and the North American Bird Conservation Initiative.

The Service established the Partners for Fish and Wildlife Program to provide technical and financial assistance to private landowners interested in improving wildlife habitat on their property. In the MAV, this primarily consists of hardwood reforestation and wetlands restoration on their property. Landowners are limited to \$25,000 per year for restoration practices.

The U.S. Department of Agriculture provides cost-share assistance to private landowners through agencies such as the NRCS and the Farm Services Agency (FSA). The NRCS administers the Wetland Reserve Program (WRP), which promotes hydrology restoration on eligible cropland through the implementation of water control structures and reforestation practices. Permanent and 30-year conservation easements are used to protect these wetlands for future use. Currently five areas totaling 3,620 acres on the refuge and seven properties adjacent to the refuge have been enrolled in the WRP program. Other programs, such as the Wildlife Habitat Incentives Program (WHIP) and the Environmental Quality Incentives Program (EQIP), provide cost-share assistance for improving water quality and wildlife habitat through practices such as establishing riparian forest buffers and upland hardwoods, and implementing water control structures.

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FSA administers the Conservation Reserve Program (CRP), which provides annual payments on eligible cropland through 10- to 15-year contracts to reforest highly erodible croplands to protect water quality and prevent soil erosion. The continuous CRP sign-up provides assistance for protecting water quality by implementing riparian and conservation buffers.

*Strategies:*

- Work with the local NRCS district conservationist to contact landowners owning property adjacent to the refuge. Explain available programs, indicating which ones specifically apply to their property and implement these programs as requested.
- Implement conservation buffers such as filter strips to reduce the impact of possible contaminants coming into Duck Lake from adjacent agricultural lands, thus minimizing the impact on amphibian and invertebrate species.
- Establish land protection priorities within the current refuge acquisition boundary based upon the habitat values and the threats to existing resources. Work with private, state, and federal partners to protect high-priority lands
- Initiate contact with all landowners within the current refuge acquisition boundary and adjacent to the refuge to determine their interest in conservation easements, partnerships, technical assistance, or selling their land for inclusion in the Refuge System (where applicable).
- Develop partnerships with conservation organizations and agencies such as The Conservation Fund and the Army Corps of Engineers to support land acquisition needs.

*Objective 3-2: Refuge Expansion Needs.* Work with inholding landowners to acquire or exchange lands that would eliminate unwanted access across the refuge and improve access to the refuge by the public and employees, and expand the current refuge acquisition boundary by 2,824 acres.

*Discussion:* The refuge was established in 1958 with 5,308 acres purchased from the Louisiana Delta Hardwood Lumber Company. Since then, the acquisition boundary has been increased several times as described in Chapter II.

There are several parcels of land that lie within the existing refuge boundary that are not owned by the Service. Several of these compromise management due to conflicting purposes and disturbance to wildlife. Acquisition or exchange of these parcels would eliminate access issues, improve management options, and tighten some unclear and confusing boundary issues.

The acquisition boundary expansion approved in 2001 for the addition of the Bushley Bayou Unit included 3,012 acres of inholdings within the approved acquisition boundary to be acquired by fee title, cooperative agreements, or conservation easements. However, when the acquisition boundary was drawn out, it neglected to allow for legal access routes into the unit. Access routes used by previous owners and users were through private property and no legal access routes were developed or identified. In fact, there is currently no legal access to any of the lands owned by the refuge in fee-title. Access is through American Electric Power Company property, which the refuge manages under a memorandum of agreement. Refuge access by the public and staff members is difficult on the Bushley Bayou Unit of the Refuge. Expansion of the refuge boundary by 2,824 acres would greatly increase refuge access by the staff and the public (Figure 12 and Appendix XIV).

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The Conservation Fund combined two grants—a North American Wetlands Conservation Act grant and a National Fish and Wildlife Foundation grant through Wal-Mart’s Acres for America Program—to facilitate the purchase of 6,052 acres of Amercian Electric Power Company land in Fiscal Year 2006. The Conservation Fund then donated these acres to the Service to be used as part of the Catahoula National Wildlife Refuge.

*Strategies:*

- Approach landowners with property within the existing refuge boundary to determine level of interest in selling land to the Service.
- Determine areas of greatest access need on the Bushley Bayou Unit and Headquarters Unit, and complete the appropriate minor expansion plans to increase the refuge acquisition boundary. Once plans are approved, approach landowners to determine level of interest in selling lands to the Service.
- Locate a realty specialist in close proximity to the refuge. A local realty specialist would be available to help with refuge realty questions and be able to respond quickly, with on-the-ground knowledge of each refuge within their area of responsibility.

*Objective 3-3: Oil and Gas.* Protect and restore habitat for fish and wildlife on refuge lands through oil and brine water spill prevention, response, and restoration.

*Discussion:* The refuge has 8 active wells, 49 inactive wells, 6 tank batteries, and numerous pipelines associated with oil and gas extraction that are in constant need of monitoring by refuge personnel. There were ongoing oil and gas operations on the refuge when it was established in 1958. Although the Federal Government owns the surface rights to the refuge, private parties own the subsurface mineral rights and state law allows those mineral rights owners to use “usual and customary” methods to access those minerals. This includes establishing road beds, wellhead and tank farm pads, and pipeline rights-of-way through the refuge. Those operations typically include characteristics that are not compatible with refuge purposes: noise; wildlife harassment; dust, erosion, hydrological alteration, and loss of habitat from oil field roads; loss of habitat and erosion on pipeline rights-of-way; and air, water, soil, sediment, and biota pollution.

Spill threats to the refuge exist from on-refuge facilities and off-refuge sources. The amount of oil recovered during the typical spill response usually amounts to less than 10 percent. Therefore, efforts would be better invested in spill prevention rather than spill response. Planning is a critical component in spill prevention. Maintenance and compliance of existing facilities is another important aspect of spill prevention. When spills cannot be prevented, a timely and effective response is in order, followed by a comprehensive natural resources damage assessment and restoration.

In August 2003, the Government Accountability Office (GAO, formerly Government Accounting Office) issued the report entitled, “National Wildlife Refuges: Opportunities to Improve the Management and Oversight of Oil and Gas Activities on Federal Lands.” GAO found shortcomings and inconsistencies within the National Wildlife Refuge System in the Service’s management and oversight of oil and gas exploration and extraction activities.

In response to this report, the Service has developed a draft handbook on oil and gas activities. The purpose of this handbook is to address the GAO recommendation that the Service provide refuge personnel with consistent guidance to effectively and consistently manage and oversee oil and gas activities.

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*Strategies:*

- Utilize the Service's Oil and Gas Handbook to oversee all oil and gas activities on the refuge.
- Work with on-refuge oil and gas operators to amicably remedy all risks of spills, improve the visual experience of refuge users, and reduce noise, air, soil, sediment, and water pollution. Foster a cooperative theme that puts wildlife protection in areas of oil and gas operations a tier higher on refuges than in an equivalent operation off refuge.
- Provide refuge monitoring of oil and gas operations to provide first alert services in the event of spills or potential threats of spills from accidents, non-compliant facilities and faulty operations. In the event of an unavoidable spill or other natural resources injuries from oil and gas operations, a cooperative Natural Resources Damage Assessment and Restoration action should be pursued consistent with Department of the Interior guidance. This process is to include all interested state and federal agencies, as well as the responsible party. If warranted, criminal enforcement procedures can be used in coordination with the Office of Law Enforcement and the U.S. Attorney's Office.
- Incorporate the refuge special use permit system into all phases of oil and gas management on the refuge where possible. Special conditions within each permit will allow clear communications to operators regarding refuge requirements for wildlife benefits that will serve as a future reference in the event of disputes and establish a fair and uniform set of rules for all refuge oil and gas operators.
- Develop timelines and procedures with operators to remove derelict oil and gas machinery and materials from the refuge at the end of its useful life or at the end of production at each location. Where machinery and materials are determined to be abandoned, work with Service, EPA, and state programs for their removal.
- Collect soil, sediment, tissue, and water quality samples to develop baseline data on oil-and-gas-related hydrocarbon, metals, and saltwater contamination for the purposes of long-term ecological monitoring and Natural Resources Damage Assessment and Restoration.
- Seek potential funding sources and partnerships of a conventional and/or innovative nature to procure mineral rights from willing sellers, such as legislative action, Natural Resources Damage Assessment and Restoration settlements, criminal settlements, corporate or non-government organization partnerships, and other sources yet to be developed.
- Consolidate pipeline rights-of-way where practical to eliminate habitat loss by pipeline right-of-way footprints and to limit spill risk. Disallow all new pipeline rights-of-way as they are incompatible with refuge purposes.
- Develop a Geographical Information System program to track refuge pipeline rights-of-way, facilities in need of removal, wells to be plugged and abandoned, and spill management.

*Objective 3-4: Pollution Prevention.* Identify and prevent injury to refuge natural resources from pollution.

*Discussion:* The greatest contaminant threats to the refuge are related to pesticides, on- and off-site oil and gas spills, and mercury.

Much of the watershed and area surrounding the refuge is in timber, row crops, and livestock production. Some of the pesticides proposed or used for row crops, particularly cotton, such as Carbofuran, could have impacts on the refuge as they accumulate in the watershed and flow through the refuge or other surrounding water bodies. Carbofuran has killed more birds than any other pesticide. It is five to ten times more toxic to waterfowl than to other birds. Carbofuran is also toxic to mammals. Humans are advised not to enter treated fields for 48 hours after application. Airborne contaminants could find their way into refuge ponds.

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Biosolids may contribute heavy metals and persistent organic pollutants that survive the furnace or other methods of sanitization of the material from human waste treatment plants. Atrazine, which may be the most widely used herbicide in corn, sorghum, and some sugar cane production, has recently been recognized as causing deformities in amphibians.

Mercury is a common topic in both freshwater and saltwater fish contamination. Most of the mercury is from atmospheric depositions, some naturally occurring, some from man-caused sources like coal-burning power plants, incinerators, and gas well manometers, etc. But for the mercury to become effectively toxic it must be methylated and, in Louisiana, that typically requires backwater areas with high sulfur compounds, low pH and the right bacteria. Two other factors needed include the presence of organic matter located in the sediments and water column, which provides a nutrient rich environment for bacterial activity and a reduction in oxygen levels within the backwater areas. This oxidation reduction potential is the best indicator of the chance for mercury to be methylated (Piehler 2006). Long-lived carnivorous fishes are typically the targets of concern for mercury pollution. Fish cannot purge their body burdens of mercury like birds and mammals, so they bio-accumulate the mercury in their organs and flesh, especially the fillets (e.g., muscle tissue) typically consumed by man. In fresh water, the largemouth bass is usually the focal species of methyl mercury contamination. Catahoula Lake has a mercury advisory posted by the State of Louisiana for fish consumption. The source of that mercury is unknown. The lake is also listed by the Environmental Protection Agency as a 303(d) impaired water body for oil and grease, salinity, total dissolved solids, chlorides, and sulfates.

The refuge is threatened by off-refuge oil operations on the surface of Catahoula Lake and surrounding watersheds. Catahoula Lake is fed from the north by Little River and Castor Creek. Those waterways run through numerous oil fields of the Tullos-Urania area that are the most out of compliance in the state. Most of these wells are “stripper wells,” requiring the recovery of over a hundred barrels of saltwater for every barrel of oil recovered. This saltwater is usually injected back underground, but in many cases it is illegally released to surface waters. Saltwater releases in the area are virtually constant, with numerous oil spills. By the time these contaminants reach the lake, they are well entrained into the water column and generally not visible at the surface, thus not posing a direct acute threat to waterfowl and water birds from oiling, but posing a considerable concern for water quality and chronic impacts to the supporting ecosystems for refuge trust resources.

*Strategies:*

- Work with the contaminants personnel at the Ecological Services Field Office in Lafayette, Louisiana, and the Louisiana Department of Environmental Quality to establish and implement sampling protocols to determine baseline and episodic air, soil, sediment, tissue, and water quality contamination. Seek funding from the National Contaminants On and Off Refuge Investigations Program, U.S. Geological Survey, and other sources.
- Coordinate closely with the Ecological Services Contaminants Specialists at the Service’s Regional Office and its Louisiana Field Office on pesticides used on the refuge. Comment on EPA’s Emergency Exemptions posted in the Federal Register for the use of toxic chemicals in croplands with drainage into the refuge.
- Develop a Geographical Information System program to determine refuge pollution risks from contributory watersheds and backwater flooding events.
- Implement an investigation into the source of mercury involved in the current fish consumptions and post current advisories on refuge informational boards/kiosks and in refuge publications.

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*Objective 3-5: Cultural Resources.* Protect cultural and historic resources from disturbance or inadvertent damage that could occur as a result of refuge activities.

*Discussion:* Cultural resource and historic preservation laws outline several considerations, including: (1) inventory of “historic sites” by each agency and assessment of the site’s eligibility for the National Register of Historic Places; (2) consideration of impacts to cultural resources during implementation of the agency’s management activities; (3) protection of cultural resources from looting and vandalism; and (4) consultation with groups, such as Native American tribes and African American communities, to address how management activities might impact archaeological sites deemed important to those groups.

A key objective for the refuge is a comprehensive archaeological survey of all refuge lands. However, there has been no comprehensive survey of the refuge properties, so no properties on the refuge have been determined to be eligible for the National Register of Historic Properties (NRHP). Nevertheless the refuge follows standard NHPA Section 106 procedures to protect the public’s interest in preserving its cultural and historic legacy. The standard is that whenever construction work is undertaken that involves any excavation with heavy earth-moving equipment like tractors, graders, and bulldozers, such as for the development of moist-soil units, the refuge will contract with a qualified archaeologist/cultural resources expert to conduct an archaeological survey of the subject property. The results of this survey will be submitted to the Regional Historic Preservation Officer (RHPO) as well as the State Historic Preservation Officer (SHPO), which in Louisiana is an official within the Division of Archaeology of the Louisiana Department of Cultural Recreation, Office of Cultural Development (Williams 2005). The SHPO reviews the surveys and determines whether cultural resources will be impacted, that is, whether any properties listed in or eligible for listing in the NRHP will be affected. If cultural resources are actually encountered during construction activities, the refuge must notify the SHPO immediately.

*Strategies:*

- Secure funding and develop a comprehensive archaeological survey of all refuge lands.
- Develop a Geographic Information System layer for the refuge’s archaeological and historic sites.
- Develop a partnership with the Jena Band of Choctaw Indians to interpret the significance of the refuge’s archaeological sites to Native Americans and the general public.
- Comply with all regulations and policy set forth in the National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Grave Protection and Repatriation Act.

*VISITOR SERVICES*

**Goal 4: To have visitors and local communities value the refuge and balanced wildlife-dependent recreation, leading to a greater appreciation of fish and wildlife resources.**

*Background:* The National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that compatible wildlife-dependent recreational uses are the priority public uses of the National Wildlife Refuge System (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) and will receive enhanced consideration over other general public uses. Other uses will be permitted only when it is determined that they are legally mandated, they provide benefits to the Service, they occur due to special circumstances, or they facilitate one of the priority wildlife-dependent recreational

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uses (See 605 FW 1, General Guidance, and 603 FW 1, Appropriate Refuge Uses). Where conflicts do not exist with the refuge purpose (e.g., migratory bird management, where applicable), refuge properties should be open for priority, wildlife-dependent public uses of the refuges as listed in the National Wildlife Refuge System Improvement Act of 1997.

*Objective 4-1: Hunting.* Provide quality and safe hunting opportunities, such as squirrel, deer, and waterfowl, in support of the refuge's established purposes, wildlife and habitat management objectives, and state rules and regulations.

*Discussion:* The refuge currently allows hunting of white-tailed deer, squirrel, rabbit, rail, gallinule, snipe, woodcock, and waterfowl. Additionally, feral hog and raccoon may be taken as incidentals.

The deer hunts are separated into archery, muzzleloader, and modern gun, depending upon specific dates.

*Strategies:*

- Build handicap-accessible blinds and have an annual handicap hunt and/or youth hunt.
- Increase capacity of parking areas as needed or use parking bumpers to increase efficiency of current parking areas.
- Manage hunt program to achieve population and wildlife habitat objectives.
- Enhance existing access to allow for improved hunt program.
- Monitor wildlife populations via surveys, harvest data, and periodic health checks.

*Objective 4-2: Fishing.* Provide a quality fishing program consistent with sound biological principals for 10,000 visitors carried out in accordance with state regulations.

*Discussion:* Fishing and crawfishing opportunities are offered year-round on Cowpen Bayou, Highway 28 borrow pits of the Headquarters Unit, and the Bushley Bayou Unit. However, Muddy Bayou, Duck Lake, Willow Lake, Highway 84 borrow pits, and all other Headquarters Unit waters are only opened to fishing from March 1 through October 31.

*Strategies:*

- Provide fishing safety information, rules, and regulations to increase public awareness and experience.
- Develop and improve handicap parking spots and approach at the fishing pier on Cowpen Bayou and at the handicap dock on Duck Lake.
- By 2010, provide ample opportunities for public use of the aquatic resources. The tasks in order of importance are to (1) improve sport fishery in Duck Lake; (2) continue to allow fishing from March 1 to October 31 each year; and (3) allow crawfishing by the public from March 1 to June 15 or at the time of dewatering for moist soil each year.
- Improve public access to bank fishing areas, such as Willow Lake, Duck Lake, and Bushley Creek.
- Evaluate logistics and safety considerations in creating suitable boat ramp sites on Bushley Creek and other appropriate areas.
- Update and implement Sport Fishing Management Plan in consultation with state and federal partners to ensure a quality fishing experience.
- Develop a pond on Bushley Bayou Unit as a place for annual kids' fishing day.

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*Objective 4-3: Wildlife Observation and Photography.* Improve access and opportunities for wildlife observation and photography refuge-wide with emphasis on the Headquarters Unit.

*Discussion:* As described in Chapter II, the refuge Headquarters Unit provides several opportunities for wildlife viewing and photography, including two designated hiking trails, an observation tower, and the auto tour drive. Other units provide opportunities along trails, roads, and diverse habitats.

The observation tower overlooks Duck Lake, which draws a variety of waterfowl, shorebirds, wading birds, and raptors. The wildlife drive parallels Cowpen Bayou, which provides a chance to see other bird species, alligators, turtles, otters, and other wildlife. Much of the wildlife drive takes visitors through a bottomland hardwood forest, where bobcat, white-tailed deer, and feral hogs can be seen.

With over 200 species of birds recorded on the refuge, birding is one of the most popular forms of wildlife observation on the refuge. Viewing wintering ducks and geese, looking for spring and fall migratory birds, and seeking songbirds or unusual species, such as the wood stork, painted bunting, or bald eagles are common practices for local and traveling “birders.”

Visitors may also see other common forms of wildlife, such as hawks and owls, white-tailed deer, raccoon, squirrel, snakes, turtles, beavers, and a variety of songbirds.

*Strategies:*

- Create short trails (one or two) to Duck Lake on west side of Wildlife Drive and designate no-hunting zones around these trails.
- Add a spotting scope and interpretive panel to newly remodeled observation tower.
- Develop pull-offs on Wildlife Drive at key wildlife viewing spots and create view windows in the vegetation at these spots. Widen Wildlife Drive to allow for two-way traffic.
- Develop an observation platform and boardwalk at end of the nature trail.
- Work with local photographers to determine a good spot for a photo blind at Duck Lake.
- Work with NRCS to develop native grasses in the Willow Lake Unit and develop a birding trail through the grassland area.
- After establishing wading bird and shorebird habitat on Bushley Bayou Unit, determine if it is appropriate for a trail and observation platform.

*Objective 4-4: Environmental Education.* Initiate and develop a community- and curriculum-based environmental education program with LaSalle and Catahoula Parish schools and local conservation groups.

*Discussion:* The refuge does not have a facility that is appropriate for groups to meet in for education programs. There is no outdoor classroom area at the refuge, but there is a large area in the shop that can be used if necessary. Presentations and tours are provided to groups if requested. The refuge averages less than 10 requests per year for on-site presentations. Most of the environmental education programs for the refuge are done off-site. Office assistant Kim Randall provides presentations to 4-H Clubs, local elementary schools, home school groups, and library groups on topics including Louisiana mammals, Catahoula National Wildlife Refuge, endangered species, and wetlands.

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The refuge has not developed an outreach plan for specific issues such as Catahoula Lake Partnership, reforestation, migratory birds, hunting and fishing opportunities, and other partnerships. The primary audiences identified by the staff include: hunters, anglers, birders, local farmers, and refuge neighbors. The refuge includes messages about the Service and the National Wildlife Refuge System in its outreach materials and programs.

The main outreach tools utilized are news releases, information exhibits at special events, and the refuge's Internet site. The refuge has a good working relationship with the local news media but more should be done to develop proactive opportunities to utilize the media. Special events include Migratory Bird Day at the Alexandria Zoo, special events at neighboring refuges, Kids Fishing Day, and Jena Community Event. In addition to special events, the refuge also provides presentations to groups such as local retirement homes and civic clubs.

*Strategies:*

- Work with local teachers to ensure that activities associated with refuge critter crates meet the Louisiana educational standards of learning.
- Focus education to off-site events, present or display at other organizations' events, and develop strategies to maximize off-site education.
- Host annual teacher workshop to promote environmental education-based curriculum in local schools.
- Develop outdoor classroom, possibly on Headquarters Unit, to support environmental education-based curriculum in local schools.
- Increase involvement in and update local public on refuge activity.

*Objective 4-5: Environmental Interpretation.* Develop interpretive program that will increase awareness of habitat features, wildlife values, and management programs on the refuge.

*Discussion:* The primary themes for the refuge are bottomland hardwoods, reforestation, native wildlife, endangered species, migratory waterfowl, wetlands, and mammals. Currently, when requested, the staff will provide guided walks or give nature talks to groups. There are few interpretive panels on any of the trails. The limited information available in the reception area of the office and at the headquarters kiosk needs to be updated. The general brochure, which provides information about the Duck Lake area, needs to be updated to include the Bushley Bayou Unit. The refuge has developed a portable exhibit with images of the refuge and various species. This exhibit is used at special events.

*Strategies:*

- Update the general brochure to include the Bushley Bayou Unit information.
- Update the six-panel kiosk at the Headquarters Unit.
- Expand the office to incorporate an interpretive display and develop interpretive panels for the reception area of the office.
- Develop interpretive panels for the observation tower.
- Develop interpretive panels, more benches, and directional areas for the nature trail.

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*Objective 4-6: Facilities and Support.* Improve access, facilities, and program support to promote year-round wildlife-dependent recreation within five years of the plan.

*Discussion:* Outreach and biological monitoring are supported only by volunteer efforts. Volunteer management will involve prioritizing staff time to orient and manage volunteers and guide them as they provide needed services to supplement current refuge programs. The refuge does not have a friends group and there is no community interest in forming such a group at this time.

*Strategies:*

- Develop volunteer program to help meet needs of refuge such as disabled hunters' hunt, wood duck nest box project, off-site education, and trail maintenance.
- Consider having a youth conservation corps (YCC) program, including an adult leader.
- Expand office facility to include environmental education and interpretive displays.
- Construct a visitor and environmental education center, possibly on the Headquarters Unit.
- Develop a Visitor Services Plan by 2010.
- Put composting toilet at headquarters kiosk.

## *REFUGE ADMINISTRATION*

**Goal 5: Provide administrative support to ensure that the goals and objectives for refuge fish and wildlife populations, habitats, land conservation, and visitor services are achieved.**

*Background:* The administrative functions associated with a refuge include a wide array of activities that are critical to the mission of the Refuge System and the purpose of each refuge. These functions include staffing, training, budgeting, planning, refuge access, law enforcement, facilities, community relations, partnering, and maintenance. Refuges must have appropriate staff, facilities, equipment, and funding in order to accomplish their overall goals and objectives.

*Objective 5-1: Staffing and Budget Needs.* Work with the Regional Office to identify critical staffing and budget needs that are realistically possible within the next 10 to 15 years.

*Discussion:* Currently, there are only four employees dedicated to the management of the refuge. The staffing level limits the refuge's ability to meet its waterfowl and habitat management objectives, public use objectives, and law enforcement objectives. The refuge is predominately bottomland hardwood forest in need of management, and a refuge biologist and forester will allow the refuge to provide quality habitat for waterfowl, neotropical migratory birds, and Louisiana black bear. One full-time law enforcement officer will help protect the resources. Funding of seven new positions will substantially increase the refuge's ability to meet its management obligations.

*Strategies:*

- Develop staffing plan with the Regional Office, which will include biologist, forester, park ranger (law enforcement), engineering equipment operator, assistant refuge manager, maintenance worker, and park ranger (interpretive).
- Acquire budgetary resources to purchase and replace fundamental equipment necessary to perform wetland and waterfowl management objectives, such as dozer, motor grader, disc, mower, and farm tractor.

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*Objective 5-2: Law Enforcement.* Maintain highly trained and effective law enforcement personnel to ensure trust resource protection, visitor safety, and enforcement of all refuge-related acts and regulations.

*Discussion:* Protecting the natural resources of the refuge and ensuring the safety of its visitors are fundamental responsibilities of the National Wildlife Refuge System. Catahoula Refuge is accomplishing this responsibility with two dual-function officers. As crime continues to increase in rural America, refuges face a larger and more complicated enforcement problem. In addition to over 10,000 natural resource violations, other serious felonies (e.g., homicides, rapes, assaults, and acts of arson) are occurring on refuges every year.

*Strategies:*

- Add one full-time park ranger (law enforcement) and maintain current dual-function officers.
- Provide up-to-date training and equipment to all full-time and dual-function officers.
- Develop memorandums of understanding with state and parish law enforcement agencies to facilitate cooperation and assistance in law enforcement activities.
- Provide education and outreach programs in the local community as part of a preventive law enforcement effort.
- Provide assistance to service special agents and state conservation officers for off-refuge activities as requested.



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## V. Plan Implementation

### INTRODUCTION

Refuge lands are managed as defined under the National Wildlife Refuge System Improvement Act of 1997. Congress has distinguished a clear legislative mission of wildlife conservation for all national wildlife refuges. National wildlife refuges, unlike other public lands, are dedicated to the conservation of the Nation's fish and wildlife resources and not wholly dedicated to recreational uses. Priority projects emphasize the protection and enhancement of fish and wildlife species first and foremost, but considerable emphasis is placed on balancing the needs and demands for recreation and environmental education.

To accomplish the purpose, vision, goals, and objectives contained in this plan for Catahoula National Wildlife Refuge, this section identifies projects and a cost summary, funding and personnel needs, volunteers, partnerships opportunities, step-down management plans, a monitoring and adaptive management plan, and plan review and revision.

### PROPOSED PROJECTS

Listed below are the proposed project summaries and their associated costs for baseline data collection and interpretation, exotic species control, habitat restoration and management, land protection, facility development and maintenance, and staffing over the next 15 years. This proposed project list reflects the priority needs identified by the public, the planning team, and refuge staff based upon available information. These projects were generated for the purpose of achieving the refuge's objectives and strategies. The primary linkages of these projects to those planning elements are identified in each summary. Table 6 presents a summary of these projects and costs.

#### *FISH AND WILDLIFE POPULATION MANAGEMENT*

##### *Project 1: Science-based Inventory and Monitoring of Plant and Animal Populations*

Science-based inventories and monitoring of plant and animal populations are critical to ensuring the biological integrity of the refuge. Information collected will serve as the basis for developing habitat management plans and will influence all refuge management activities. A systematic inventory and monitoring program will enable the refuge to make informed management decisions and valuable long-term contributions to national and regional objectives for waterfowl, neotropical migratory birds, shorebirds, wading birds, wintering forest and scrub/shrub birds among others, and resident wildlife. Standardized census and survey techniques will be employed and all data compiled into databases, including GIS for spatial analysis. This information is critical to formulating management actions and evaluating wetland restoration and other refuge programs. All data will be shared with appropriate state and federal partners in an effort to further ecosystem management. This project will add a wildlife biologist position to support this annual inventory and monitoring effort. The estimated first-year cost for this project is \$135,000, with a recurring cost of \$60,000 per year. (*Linkage: Goal 1, Objectives 1-1, 1-2, 1-3, 1-4, 1-5, 1-7, 1-8, 1-11,1-12, 1-13, 1-14.*)

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*Project 2: GIS and Spatial Technology Package*

A GIS will enable the refuge to generate the high-quality maps needed for presenting information on habitat and natural and cultural resource databases required for evaluation of land protection plans and pollution risks from off-refuge activities, and for presenting information on archaeological sites and historic resources. Census and survey data will be compiled into GIS databases for spatial analysis. This information is critical to formulating management actions and evaluating restoration and other refuge programs. These systems will also be useful for analyzing baseline data on contaminants from contributory watersheds and backwater flooding events. The estimated cost for this project is \$20,000. (*Linkage: Goal 1, Objective 1-4*)

**HABITAT MANAGEMENT**

*Project 3: Bushley Bayou Unit Minnow Pond*

Abandoned minnow ponds will be configured to allow for management of ponds as moist-soil impoundments for shorebirds, wading birds, and waterfowl and impoundments with emergent vegetation for rail habitat. A partial underground water delivery system is in place and two centrifugal pumps have been obtained. Connections to the existing underground pipes, installation of a new underground system on the south side of Flat Creek, a new deep-water well to provide water to either of the ponds on the north or south side of the creek, and two power units to run the centrifugal pumps are needed. Several new water control structures are also needed to allow for better handling of water. An estimated cost for this project is \$125,000, with a recurring cost of \$10,000 per year. (*Linkage: Goal 2, Objective 2-2.*)

*Project 4: Forest Habitat Management*

An active forest management program will become increasingly important if the refuge is to contribute to regional and national goals for migratory birds and the Louisiana black bear. A forest inventory has been conducted by contract foresters and Service staff via continuous forest inventory (CFI) plots. CFI plots will be resampled in the future to track the forest composition and species diversity changes in response to time and management practices. A one percent timber cruise has been completed by another contract forester covering the forested acreage of the refuge in order to provide information needed for the updating of the forest management plan. The development and implementation of a forest management plan is critical to creating spatially diverse forests to support source populations of migratory and resident wildlife. Included in this project is a forester position to plan and implement forest management and inventory. The estimated first-year cost of this project is \$145,000, with a recurring cost of \$74,000 per year. (*Linkage: Goal 2, Objective 2-1.*)

*Project 5: Heavy Equipment Package*

This project will complete essential rehabilitation work on over 21 miles of gravel roads, 9 miles of dirt roads, 23 miles of all-terrain vehicle trails, and 4 miles of levees. It will include the hiring of one engineering equipment operator; replacement of numerous collapsed culverts; graveling of damaged sections of roads; installation or replacement of water control structures; building or repair of levees; purchases of essential heavy equipment to complete rehabilitation and development projects; and the removal of woody vegetation from road and levee shoulders. This work, along with the needed heavy equipment, is critical for restoring the refuge's hydrology and enhancing its accessibility to the public. Necessary equipment includes an excavator with tree cutter attachment (\$230,000); a gravel trailer (\$35,000); a 16-yard pull-behind dirt scraper (\$25,000); a boom-axe with tractor (\$50,000); a truck and trailer (\$125,000); and a 120 hp tractor with bushhog mower and disk (\$120,000). The estimated first-year cost of this project is \$685,000, with an annual recurring cost of \$100,000. (*Linkage: Goal 1, Objective 1-4.*)

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*Project 6: Invasive and Exotic Species Control*

The refuge's biological integrity is threatened by a variety of invasive species. This project will develop and implement an integrated pest management program to control invasive and nuisance plants and animals. Invasive plant occurrence will be mapped and quantified. Appropriate integrated pest management strategies will be used to control water hyacinth, American lotus, and buttonbush in all water bodies; alligator weed, *sesbania*, cocklebur, and Johnsongrass in moist-soil units; and Chinese tallowtrees in reforestation areas. Strategies will include chemical, mechanical, and biological control techniques. This project will add a maintenance worker position (\$53,000) and a tractor mounted, PTO-driven spray rig (\$1,500). Being omnivores, feral swine utilize virtually every component of the habitat and directly compete with native wildlife, reducing the habitat's carrying capacity and adversely affecting wildlife's reproduction and recruitment. Feral swine are compromising the refuge's efforts in wetland restoration, reforestation, and species recovery. The estimated cost is \$80,000, with a recurring cost of \$63,000 per year. (*Linkages: Goal 1, Objectives 1-7, 1-12, 1-14; Goal 2, Objectives 2-1, 2-2, 2-3; Goal 4, Objective 4-1.*)

*Project 7: Fire Management Package*

Prescribed fire is an important tool in the management of refuge habitats. Fire is useful in the control of unwanted brush and woody species. The estimated cost is \$10,000 with a recurring cost of \$6,000 per year. (*Linkage: Goal 2, Objective 2-3.*)

*Project 8: Grassland Rehabilitation*

A 95-acre open area will be managed for grassland bird species through a series of management actions including burning, mowing, discing, and seeding of native grasses and forbs. The estimated cost of this project is \$20,000, with a recurring cost of \$2,000 per year. (*Linkage: Goal 2, Objective 2-3.*)

## RESOURCE PROTECTION

*Project 9: Boundary Lines Survey- Bushley Bayou Unit*

Several portions of the current refuge boundary have not been surveyed and other portions have inadequate field points that preclude accurate boundary delineation. Registered surveys provide a legally defensible boundary line that is critical to resource protection and public relations, especially with regard to adjacent landowners. This project will fund surveys for approximately 40 miles of boundary line at an estimated cost of \$5,000 per mile. The total cost of this project is \$200,000, with a recurring cost of \$3,000 per year. (*Linkages: Goal 3, Objectives 3-1, 3-5; Goal 4, Objective 4-1.*)

*Project 10: Refuge Acquisition Boundary Expansion*

The refuge is proposing a minor expansion for the addition of 2,824 acres. This expansion is important to the refuge and the public because it allows for more and better access to portions of the refuge previously hard to reach and it increases the refuge's ability to manage the habitats for wildlife in a more consistent fashion. Land would be purchased only from willing sellers. The estimated cost of this project is between \$2 and \$4 million to expand the current refuge acquisition boundary by 2,824 acres. (*Linkages: Goal 3, Objective 3-2; Goal 4, Objectives 4-1, 4-2.*)

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*Project 11: Land Protection within Approved Refuge Boundary*

Through a combination of fee title purchases from willing sellers and leases, cooperative agreements, and conservation easements with willing landowners, the Service will continue to purchase interest in the remaining 3,012 acres within the existing refuge boundary. The Service will acquire sufficient interest in the identified lands to prevent conflicting land uses and to provide the management flexibility required to protect and manage the habitat as a national wildlife refuge. Additionally, this project will eliminate numerous small inholdings and consolidate refuge boundaries, eliminating many administrative and public access issues. The acquired lands will be made available to the public for additional wildlife-dependent recreation. All acquisitions will be made from willing sellers. Potential funding sources for this project include the Migratory Bird Conservation Fund, Land and Water Conservation Fund, carbon sequestration, and cooperative efforts with various Service partners. The estimated cost of this project is \$4 to \$6 million. (*Linkage: Goal 3, Objectives 3-1, 3-2.*)

*Project 12: Contaminants Survey*

The greatest contaminant threats to the refuge are from pesticides, on- and off-site oil and gas spills, and mercury. An initial step in reducing and preventing future contamination is to hire an assistant refuge manager whose duties will be to establish and implement sampling protocols for determination of baseline and episodic air, soil, sediment, tissue, and water quality contamination levels. This baseline information will enable the refuge to monitor and evaluate the extent of the contaminant issues affecting refuge fish and wildlife resources, including amphibian and invertebrate species, and to develop measures for minimizing these impacts. The estimated first-year cost of this program is \$243,000, with a recurring cost of \$100,000 per year. (*Linkage: Goal 3, Objectives 3-3, 3-4.*)

*Project 13: Archaeological Survey*

A comprehensive archaeological survey of Catahoula Refuge will be conducted. This project is essential to meet federal cultural resource mandates and will provide the baseline information needed for protection of existing resources and resource/public use development activities. The estimated first-year cost of this project is \$123,000, with a recurring cost of \$3,000. (*Linkage: Goal 3, Objective 3-5.*)

## VISITOR SERVICES

*Project 14: Wildlife Observation Package*

This project would improve the current boardwalk and trail and hiking trails, create handicap accessible photo blinds, new observation tower and boardwalk incorporating wildlife observation and interpretation to sites at Duck Lake, on the Headquarter's Unit. Each site would include parking, maintained trails with boardwalks, foot bridges (when necessary), interpretive panels, and observation blinds or platforms. Informational brochures and interpretive panels would describe the area's natural and cultural resources, refuge management programs, and the National Wildlife Refuge System. The estimated cost of this project is \$283,000, with a recurring cost of \$13,000. (*Linkage: Goal 4, Objective 4-3.*)

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*Project 15: Roads Projects*

The primary access roads to the refuge's water control structures in the Minnow Ponds waterfowl management area and the west side of the Bushley Bayou Unit are constructed of dirt. These dirt roads are used on a daily basis to transport equipment, monitor the water management system, and perform associated maintenance activities. The roads become impassable during wet weather and hinder refuge management. Upgrading them would consist of shaping the road beds, adding culverts, and applying 6 inches of gravel. This project would ensure dependable all-weather access to perform critical refuge operations and allow the development of compatible wildlife-dependent recreation in an area of the refuge that is presently closed to vehicular access. The estimated first-year cost of this project is \$1.8 million, with a recurring cost of \$6,000. (*Linkages: Goal 4, Objective 4-6; Goal 5, Objective 5-1.*)

*Project 16: Duck Lake Sport Fishery Improvement Project*

Duck Lake, a 1,200-acre impoundment, at one time was a popular recreational fishing destination for people in Central Louisiana. However, during the drawdown for the replacement of the water control structure, Duck Lake went dry, the native fishery was wiped out, a variety of invasive and exotic vegetation, including American lotus and buttonbush, infiltrated the lake. This project will restore the sport fish population in Duck Lake to a level that will sustain a recreational fishing program. Strategies will include control of invasive and exotic plant species through chemical, biological, or mechanical techniques, enhanced water management capabilities, and construction of a canal from the water control structure to Little Lake Slough, as per guidelines set by Baton Rouge Fisheries Resource Office. The estimated cost is \$150,000, with a recurring cost of \$15,000 per year. (*Linkage: Goal 4, Objective 4-2.*)

*Project 17: Visitor Service Program Support Package*

Currently, Catahoula Refuge offers only limited opportunities for wildlife-dependent recreation due, primarily, to a lack of facilities and availability of staff to plan and implement a visitor services program. This project will add a park ranger (interpretive) to organize and implement an overall visitor services program that will include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation and include expansion of the headquarters office area. Directional and interpretive signs will be developed and placed throughout the refuge to accommodate all types of wildlife-dependent visitation. Programs and tours will be developed and provided to schools and other interested groups. The estimated first-year cost of this project is \$425,000, with a recurring cost of \$129,000. (*Linkages: Goal 4, Objective 4-5; Goal 5, Objective 5-1.*)

*Project 18: Fishing Access Improvement Package*

Fishing is a popular recreational activity on the refuge. However, inadequate public use facilities and inadequate access to fishing areas limit the public's opportunity to enjoy Bushley Creek and other places on the refuge. This project will provide directional signs, an interpretive kiosk, accessible trails and fishing pier, a parking area, boat launch on Bushley Creek, and restrooms at the existing boat ramp site. Minimum public use standards will be met at this site. The estimated total cost for this project is \$211,000, with a recurring cost of \$8,000. (*Linkage: Goal 4, Objective 4-6.*)

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## REFUGE ADMINISTRATION

### *Project 19: Equipment Replacement Package*

Refuge operations, maintenance, and law enforcement depend on reliable vehicles capable of travel both on- and off-road. The refuge uses a combination of trucks, vans, all-terrain vehicles, and boats for access. These vehicles are subjected to rough terrain and severe duty that effectively shorten their serviceable condition to less than five years. The refuge needs to replace, on average, at least one vehicle and one all-terrain vehicle per year to maintain a safe and dependable vehicle fleet. The total estimated cost of this project is \$467,000: vehicle (\$30,000); all-terrain vehicle (\$6,000); outboard motor and boat (\$10,000); bushhog mower (\$18,000); disk (\$18,000); road grader (\$160,000); backhoe (\$75,000); and bulldozer (\$150,000); with a recurring cost of \$36,000 per year. (Linkage: Goal 5, Objective 5-1.)

### *Project 20: Construct shop and fenced compound on Bushley Bayou Unit*

Currently, the refuge does not have a shop or fenced compound on the Bushley Unit. Equipment must be transported from the Headquarters Unit 10 miles away. This takes up valuable time and resources. Also, when equipment is left on the refuge, it is unprotected. Equipment, boats, and other important materials are stored in areas accessible to the public. The refuge is in urgent need to construct a shop and fenced compound to maintain equipment and keep it safe. The estimated cost of this project is \$250,000, with a recurring cost of \$5,000. (Linkage: Goal 5, Objective 5-1.)

### *Project 21: Construct pole barn at Headquarters Unit*

Currently, refuge maintenance fleet and Service vehicles are unprotected at the headquarters shop. Equipment, boats, and other important materials are stored in areas exposed to the elements. The refuge is in urgent need to construct a pole barn to maintain equipment and keep it safe. The estimated cost of this project is \$150,000, with a recurring cost of \$2,000. (Linkage: Goal 5, Objective 5-1)

### *Project 22: Law Enforcement Package*

The refuge currently receives over 2,500 hunter visits and 4,500 fishing visits annually, and increased visitation is expected as this plan is implemented. Catahoula Refuge currently has only two dual-function law enforcement officers, covering two units of the refuge and nearby Catahoula Lake, which is insufficient to meet the demands of resource protection and visitor safety. This project will add one full-time park ranger (law enforcement) to the refuge, with shared responsibilities among neighboring refuges. First-year cost of this project is \$140,000, with a recurring cost of \$80,000. (Linkage: Goal 5, Objective 5-2.)

### *Project 23: Position Upgrade Package*

Catahoula Refuge currently has a GS-0485-13 project leader, a GS-0485-11 assistant refuge manager covering 25,000+ acres of Service-managed lands and operating the water control structure on the 26,000-acre state-owned Catahoula Lake, which is insufficient to meet the demands of increased staff and management complexity associated with implementation of phase 3 of this plan. This project will upgrade the assistant refuge manager position to a deputy refuge manager position and a level commensurate with accretion of duties. The estimated cost of this project is \$15,000, with a recurring cost of \$15,000. (Linkage: Goal 5, Objective 5-2.)

**Table 6. Summary of Catahoula National Wildlife Refuge Comprehensive conservation plan projects**

Project #	Existing Budget Base		\$ Recurring Annual Cost	FTE
	Description	First-year Cost		Additional Staff FTE's*
1	Science-based Inventory and Monitoring of Plant and Animal Populations	\$135,000	\$60,000	1
2	GIS and Spatial Technology Package	\$20,000	\$2,000	
3	Bushley Bayou Unit Minnow Pond	\$125,000	\$10,000	
4	Forest Habitat Management	\$145,000	\$74,000	1
5	Heavy Equipment Package	\$685,000	\$100,000	1
6	Invasive and Exotic Species Control	\$80,000	\$63,000	1
7	Fire Management Package	\$10,000	\$6,000	
8	Grassland Rehabilitation	\$20,000	\$2,000	
9	Boundary Lines Survey – Bushley Bayou Unit	\$200,000	\$3,000	
10	Refuge Acquisition Boundary Expansion	\$2-4,000,000**	**	
11	Land Protection within Approved Refuge Boundary	\$4-6,000,000**	**	
12	Contaminants Survey	\$243,000	\$100,000	1
13	Archaeological Survey	\$123,000	\$3,000	
14	Wildlife Observation Package	\$283,000	\$13,000	
15	Roads Projects – Roads, All-Terrain Vehicle Trail, and Bridge	\$1,800,000	\$6,000	
16	Duck Lake Sport Fishery Improvement Project	\$150,000	\$15,000	
17	Visitor Service Program Support Package	\$425,000	\$129,000	1
18	Fishing Access Improvement Package	\$211,000	\$8,000	
19	Equipment Replacement Package	\$467,000	\$36,000	
20	Construct Shop and Fenced Compound (Bushley Bayou Unit)	\$250,000	\$5,000	
21	Construct Pole Barn (Headquarters Unit)	\$150,000	\$2,000	
22	Law Enforcement Package	\$140,000	\$80,000	1
23	Position Upgrade Package	\$15,000	\$15,000	
<b>Grand Total</b>		<b>\$5,677,000.00</b>	<b>\$732,000.00</b>	<b>7</b>

\* Full-time equivalents. Currently there are 4 FTEs. The CCP includes the addition of 7 FTEs.

\*\* Costs not included in Grand Total due to fluctuating land acquisition costs.

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## **FUNDING AND PERSONNEL**

Currently, a staff of four permanent positions has been approved for the refuge. To complete the extensive wildlife habitat management and restoration projects and conduct the necessary inventorying and monitoring, management, and visitor services activities, more staff is required to enable the refuge to achieve its plan objectives and strategies within a reasonable time. The annual cost (including salaries and benefits) will be \$1.05 million.

## **VOLUNTEERS**

Volunteers can provide valuable assistance to refuge staff. Currently, there are two volunteers at the refuge who are primarily involved in assisting staff with surveys and outreach activities.

## **PARTNERSHIP OPPORTUNITIES**

A major objective of this comprehensive conservation plan is to establish partnerships with landowners, private organizations, and state and federal natural resource agencies. In the immediate vicinity of the refuge, opportunities exist to establish partnerships with sporting clubs, elementary and secondary schools, and community organizations. At regional and state levels, partnerships might be established with organizations such as the Louisiana Department of Wildlife and Fisheries, Bayou State Bowhunters, The Conservation Fund, The Nature Conservancy, Ducks Unlimited, National Audubon Society, Ruffed Grouse Society, and National Wild Turkey Federation. American Electric Power and Environmental Synergy, Inc., are two of our corporate partners responsible for the carbon sequestration projects.

The refuge volunteer program and other partnerships generated will depend upon the number of staff positions the Service provides the refuge. As staff and resources are committed to the refuge, opportunities to expand the volunteer program and develop partnerships will be enhanced.

## **STEP-DOWN MANAGEMENT PLANS**

A comprehensive conservation plan is a strategic plan that guides the future direction of the refuge. Before some of the strategies and projects can be implemented, detailed step-down management plans will need to be prepared or updated. To assist in preparing and implementing the step-down plans, the refuge staff will develop partnerships with local agencies and organizations. These plans (Table 7) will be developed in accordance with the National Environmental Policy Act, which requires the identification and evaluation of alternatives and public review and involvement prior to their implementation.

**Table 7. Catahoula National Wildlife Refuge step-down management plans\***

<b>Plan</b>	<b>Completion Date</b>
<b>Biological Inventory/Monitoring Plan</b>	2009
<b>Habitat Management</b>	2008
Moist-soil/Water Management	2007
Forest Management	2008
<b>Integrated Pest Management</b>	2012
Nuisance Animal Control	2011
Exotic/Invasive Plant Control	2012
<b>Fire Management</b>	2008
<b>Visitor Services</b>	2010
Environmental Education	2010
Fishing	2009
Hunting and Trapping	2009
Wildlife Observation and Photography	2010
<b>Law Enforcement</b>	2013

\*Note: Plans are shown in sequence according to goals and objectives listed in Chapter IV.

**Biological Inventory/Monitoring Plan** (develop), draft completion 2009: This plan will describe inventory and monitoring techniques and time frames. All plant communities and associations in the refuge, as well as all trust species (e.g., migratory birds including songbirds, neotropical migratory birds, and waterfowl), listed species (e.g., federal and state threatened, endangered and species of concern), and key resident species, will be inventoried, and population trends will be monitored. These data are essential to guide the management of wildlife populations, habitat, and wildlife-dependent public use on the refuge.

**Habitat Management Plan** (develop), draft completion 2008: This plan will describe the overall desired future habitat conditions needed to fulfill refuge purpose and objectives. The plan will include three sections dealing with moist-soil/water management units, and forest. Procedures, techniques, and time tables for achieving desired future conditions will be developed into an overall plan.

- Moist-soil/Water Management Plan (update), draft completion 2007: This plan will describe the strategies and procedures (e.g., timing and duration of flooding and disturbance) for manipulating the refuge’s water management units to meet habitat management objectives.
- Forest Management Plan (update), draft completion 2008: This plan will describe strategies for meeting refuge forest management objectives. It will include direction on reforestation, stand improvement, and harvest. Also, scrub/shrub habitat management will be addressed.

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**Integrated Pest Management Plan** (develop and update), draft completion 2012: This plan will address the complex issue of bringing exotic and nuisance plants and animals to a maintenance control level on the refuge. It will cover chemical pesticide use (aerial and ground application), mechanical eradication, and biological controls. The Nuisance/Exotic Animal and Plant Control plans will be sections of this plan.

- Nuisance Animal Control Plan (develop), draft completion 2011: This plan (as part of the Integrated Pest Management Plan) will describe survey, removal or control, and monitoring techniques for both terrestrial and aquatic nuisance and exotic animals (vertebrate and invertebrate). Feral swine and beaver control will be included in this plan.
- Exotic/Invasive Plant Control Plan (develop), draft completion 2012: This plan (as part of the Integrated Pest Management Plan) will describe survey, removal or control, and monitoring techniques for both terrestrial and aquatic nuisance and exotic plants.

**Fire Management Plan** (update), draft completion 2008: This plan will describe wild and prescribed fire management techniques that will be employed on the refuge. Wildfire control descriptions will include initial attack strategies and cooperative agreements with other agencies.

**Visitor Services Plan** (update), draft completion 2010: This plan will describe the refuge's wildlife-dependent recreation, environmental education, and interpretation programs. Specific issues or items that will be addressed include facility requirements, site plans, and handicapped accessibility. The Environmental Education, Fishing, Hunting, and Sign Plans will be sections of this plan.

- Environmental Education Plan (develop), draft completion 2010: This plan (as part of the Visitor Services Plan) will reflect the objectives and strategies of the comprehensive conservation plan and address environmental education guidelines following Service standards.
- Fishing Plan (update), draft completion 2009: This plan (as part of the Visitor Services Plan) will address specific aspects of the refuge's fishing program. It will define season structures, fish areas, methods, handicapped accessibility facilities needed, and refuge-specific regulations.
- Hunting and Trapping Plan (update), draft completion 2009: This plan (as part of the Visitor Services Plan) will address specific aspects of the refuge's hunting program. It will define species to be hunted/trapped, season structures, hunt areas, methods, all-terrain vehicle use, handicapped accessibility, facilities needed, and refuge-specific hunting regulations.
- Wildlife Observation and Photography Plan (update), draft completion 2010: This plan (as part of the Visitor Services Plan) will describe the refuge's strategy for informing visitors via signage. It will incorporate Service guidelines.

**Law Enforcement Plan** (update), draft completion 2013: This plan will provide a reference to station policies, procedures, priorities, and programs concerning law enforcement.

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## **MONITORING AND ADAPTIVE MANAGEMENT**

Adaptive management is a flexible approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. More specifically, adaptive management is a process by which projects are implemented within a framework of scientifically driven experiments to test the predictions and assumptions outlined within a plan.

To apply adaptive management, specific survey, inventory, and monitoring protocols will be adopted for the refuge. The habitat management strategies will be systematically evaluated to determine management effects on wildlife populations. This information will be used to refine approaches and determine how effectively the objectives are being accomplished. Evaluations will include ecosystem team and other appropriate partner participation. If monitoring and evaluation indicate undesirable effects for target and non-target species or communities, then alterations to the management projects will be made. Subsequently, the refuge's comprehensive conservation plan will be revised. Specific monitoring and evaluation activities will be described in the step-down management plans.

## **PLAN REVIEW AND REVISION**

This comprehensive conservation plan will be reviewed annually to determine the need for revision. A revision will occur if and when conditions change or significant information becomes available, such as a change in ecological conditions or a major refuge expansion. The final plan will be augmented by detailed step-down management plans to address the completion of specific strategies in support of the refuge's goals and objectives. Revisions to the plan and the step-down management plans will be subject to public review and NEPA compliance.



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## **SECTION B. ENVIRONMENTAL ASSESSMENT**

### *I. Introduction*

#### **PURPOSE AND NEED**

The Fish and Wildlife Service prepared this Environmental Assessment for Catahoula National Wildlife Refuge in compliance with the National Environmental Policy Act and the National Wildlife Refuge System Improvement Act. The National Wildlife Refuge System Improvement Act requires the development of comprehensive conservation plans for all refuges. Following a public review and comment period on the draft comprehensive conservation plan and environmental assessment, a final decision will be made by the Fish and Wildlife Service that will guide Catahoula Refuge's management actions and decisions over the next 15 years, provide understanding about the refuge and management activities, and incorporate information and suggestions from the public and refuge partners.

An environmental assessment accompanies a draft comprehensive conservation plan for public review. The environmental assessment is used to determine and evaluate a reasonable range of alternatives for managing the refuge. Each alternative is generated with the potential to be fully developed in the plan. The environmental assessment predicts and evaluates the biological, physical, and socioeconomic effects of implementing each alternative, and identifies whether the impacts of implementing any of the alternatives are expected to have significant impacts to the human and natural environment. With this information on the range of alternatives, a planning team identifies the proposed management action.

For the Catahoula Refuge, the planning team, in accordance with guidelines of the National Environmental Policy Act, identified a number of issues, concerns, and needs through discussions with the public, agency managers, and professionals. From these issues, concerns, and needs, the Service's planning team identified three alternatives, evaluated the possible consequences of implementing each alternative, 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 guiding the refuge's future management direction.

#### **DECISIONS TO BE MADE**

Based on this environmental assessment, if no significant impacts on the human environment are identified, a Finding of No Significant Impact will be prepared. This determination will be based on an evaluation of the purposes for which the refuge was established, the mission of the Service and the National Wildlife Refuge System, and other legal mandates. Assuming that no significant impacts are found, implementation of the plan will begin, and the plan will be monitored on an annual basis and revised when necessary.

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## **AUTHORITY, LEGAL COMPLIANCE, AND COMPATABILITY**

The National Wildlife Refuge System includes federal lands managed primarily to provide habitat for a diversity of fish, wildlife, and plant species. National wildlife refuges are established under many different authorities and funding sources for a variety of purposes. The purposes for each refuge were established by specific legislation. The purposes for Catahoula Refuge are listed in the previous section. Additional authority delegated by Congress, federal regulations, executive orders, and several management plans guide the operation of the refuge. Appendix III contains a complete list of the key laws, orders, and regulations that provide a framework for the proposed action.

## **PLANNING STUDY AREA**

Catahoula National Wildlife Refuge was established in 1958, primarily as a wintering area for migratory waterfowl. The refuge, located in LaSalle and Catahoula Parishes, Louisiana, about 30 miles northeast of Alexandria and 12 miles east of Jena, now totals 25,242 acres (Section A, Table 2). The 6,671-acre Headquarters Unit borders 9 miles of the northeast shore of Catahoula Lake, a 26,000-acre natural wetland renowned for its large concentrations of migratory waterfowl. The 18,571-acre Bushley Bayou Unit, located 8 miles west of Jonesville in Catahoula Parish, was established in May 2001. The acquisition was made possible through a partnership agreement between The Conservation Fund, American Electric Power, and the Fish and Wildlife Service.

The planning study area for this environmental assessment includes the acreage within the refuge's approved acquisition boundary, including the American Electric Power-owned acreage under refuge management. The refuge totals 25,242 acres of the 28,254 acres within the approved acquisition boundary. This environmental assessment will identify management on refuge lands as well as those lands proposed to be acquired by the Service.

The refuge lies within a physiographic region known as the Mississippi Alluvial Valley (MAV). The MAV was, at one time, a 25-million acre forested wetland complex that extended along both sides of the Mississippi River from Illinois through Louisiana. Although the refuge was part of this very productive bottomland hardwood ecosystem, most of the forest on the refuge was cleared in the early 1970s for agricultural production.

## **PLANNING PROCESS AND ISSUE IDENTIFICATION**

Please refer to Section A, Chapter III, for a detailed summary of the planning process and issues used in developing the draft plan.

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## *II. Affected Environment*

For a description of the Affected Environment, see Section A, Chapter II.



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## *III. Alternatives*

### **FORMULATION OF ALTERNATIVES**

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the refuge's purpose and 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 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, restoration, and management of the refuge's fish, wildlife, plants, habitats, and other resources. Refuge staff assessed the biological conditions and analyzed the external relationships affecting the refuge. This information contributed to the development of goals and objectives and, in turn, helped to formulate the alternatives. As a result, each alternative presents different sets of objectives for reaching refuge goals. Each alternative was evaluated based on how effective it would be and how it would address the identified issues related to fish and wildlife populations, habitat management, resource protection and conservation, visitor services, and refuge administration.

### **ALTERNATIVES CONSIDERED, BUT ELIMINATED FROM FURTHER ANALYSIS**

The alternatives development process under the National Environmental Policy Act and the National Wildlife Refuge System Improvement Act is designed to allow the planning team to consider the widest possible range of issues and feasible management solutions. These management solutions are then incorporated into one or more alternatives evaluated in the environmental assessment process and considered for inclusion in the comprehensive conservation plan.

Actions and alternatives that are infeasible or that may cause substantial harm to the environment are usually not considered in an environmental assessment. Similarly, an action or an alternative containing the action should generally not receive further consideration if it is illegal; it does not fulfill the mission of the National Wildlife Refuge System; it does not relate to or achieve one of the goals of the refuge; or its environmental impacts have already been evaluated in a previously approved NEPA document.

During the process of developing alternatives, the planning team considered a wide variety of potential actions on the refuge. The following actions were ultimately rejected and excluded from the alternatives proposed because they did not achieve refuge purposes or were incompatible with one or more goals:

- Horseback riding
- Opening refuge to unlimited all-terrain vehicle use
- Leaving personal property on refuge overnight

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## DESCRIPTION OF THE ALTERNATIVES

For each alternative, a number of goals and sets of objectives and strategies were developed to help achieve the refuge's purpose and the mission of the refuge system. These goals and objectives served as a basis for developing and evaluating the desired conditions or outcomes. They were grouped into sets and, for this planning effort, consolidated into three alternatives. These alternatives represent different approaches for managing the refuge over a 15-year time frame while still meeting the refuge purposes and goals. Goals are common for each of the alternatives; however, objectives and strategies may differ among alternatives. The three alternatives are summarized below. A comparison of each alternative follows the general descriptions (Table 8).

The Service planning team has identified Alternative B as the proposed alternative. This alternative was developed based on public input and the best professional judgment of the planning team. The objectives and strategies presented in this draft plan were developed as a direct result of the selection of Alternative B.

### *ALTERNATIVE A – NO ACTION (CURRENT MANAGEMENT DIRECTION)*

Existing refuge management practices and uses would continue under this alternative. All refuge management actions would be directed towards achieving the refuge's primary purposes, which include: (1) providing migrating and wintering habitat for migratory waterfowl consistent with the overall objectives of the Mississippi Flyway; (2) providing nesting habitat for wood ducks; (3) providing habitat and protection for threatened and endangered species; and (4) managing bottomland hardwoods and providing habitat for natural wildlife diversity. Refuge staff would continue to restore and maintain existing bottomland hardwood forest, moist-soil units, and grassland habitats. Management programs would continue to be developed and implemented with limited baseline biological information. Active habitat wetland management would be implemented by continuing water level manipulations for moist soil. Grassland and forest management actions are designed to provide diversified foraging, resting, and breeding habitat requirements for a variety of species and would be implemented only when resources are available. A summary of the current acreages by habitat type can be found in Section A, Chapter II.

Land would be acquired from willing sellers within the current 28,254-acre acquisition boundary. Oil and gas operations would continue under current special use permits, with little opportunity to prevent potential risks of spills. There would be no water quality surveys or pollution prevention measures for improving or providing increased protection of refuge lands and water.

Hunting and fishing would continue to be the major focus for the public use program, with no expansion of current opportunities. Current restrictions or prohibitions would remain. Environmental education and interpretation and wildlife observation and photography would be accommodated as they are at present, as resources are available.

Law enforcement of refuge regulations and for protection of wildlife and visitors would continue at current levels. The current refuge program portion, Section A, Chapter II, contains more detail about the current environment and management direction of the refuge.

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## *ALTERNATIVE B – ACTIVE MANAGEMENT (PROPOSED ALTERNATIVE)*

Under this alternative, the emphasis would be on improving refuge resources for wildlife, while providing additional hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation opportunities. This alternative would also allow the refuge to provide law enforcement protection that adequately meets the refuge purposes.

As with Alternative A, management efforts would focus on achieving the refuge's primary purposes. Under Alternative B, management would provide greater enhancement and management of habitats and associated plant communities for the greater benefit of wildlife. Extensive wildlife and plant census and inventory activities would be initiated to obtain the biological information needed to implement management programs on the refuge. The refuge would improve migratory waterfowl habitat, the wood duck nest box program, habitat to support breeding pairs of wading birds, and migration habitat for southbound and northbound shorebirds. Habitat management activities would focus on providing healthy bottomland hardwood forests, moist-soil units, and grasslands needed to achieve wildlife population objectives. Forested habitat would be managed to establish a multilayered canopy that promotes and maintains structural and plant species diversity. Bottomland hardwood forests would also be actively managed to support key species of migratory and resident species. To improve habitat for grassland birds, the refuge would work with NRCS to replant the 95-acre Willow Lake area with native warm-season grasses. A summary of the current acreages by habitat type can be found in Section A, Chapter II.

The refuge would inventory and more aggressively monitor, control, and, where possible, eliminate invasive plants. Control of nuisance wildlife would focus on those having the greatest negative impact on native habitat and wildlife and would include trapping and control of furbearing species.

An archaeological survey to identify potential cultural resources would help in planning for land protection. The refuge would work closely with partners to acquire or exchange lands with willing inholding landowners and to expand the current acquisition boundary by 2,824 acres in order to improve access for refuge staff and the public (See Figure 12 and Appendix XIV).

The refuge would continue to work with the state and oil companies to identify and eliminate potential spill risks from oil and gas activities, to continue the refuge special use permit system, and to provide monitoring for first alert in spill events. In addition, as a step towards reducing pollution, refuge staff would work with the Service's Ecological Services Office to establish protocols for baseline air, soil, and water contamination, and to better determine the source of contaminants, such as pesticides and mercury.

Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation opportunities would be improved. Youth hunts, handicap-accessible blinds, improved access for bank fishing, replacement of the observation tower and an additional tower, and supporting environmental-based curricula in the local schools are some of the improvements planned under Alternative B. In addition, the current office facility would be expanded to accommodate an environmental education display and an interpretive display.

Additional staff would include a biologist, forester, park ranger (law enforcement), engineering equipment operator, maintenance worker, assistant refuge manager, and park ranger (interpretive) to accomplish objectives for establishing baseline data on refuge resources, for managing habitats, and for adequate protection of wildlife and visitors.

**ALTERNATIVE C – MINIMAL MANAGEMENT**

Under this alternative, there would be minimal active management of refuge resources. Grasslands would be left fallow and moist-soil units would not be actively managed. Bottomland hardwood forests would be left to mature with no active management.

One hundred wood duck nest boxes would be left in place and banding quotas would not typically be met. There would be no active management of marshbird, long-legged wader, shorebird, or forest breeding bird habitat. The refuge would continue to support Southeast Regional Bald Eagle Management Guidelines when nests are encountered.

The refuge would continue to attempt to acquire land from willing sellers within the current 28,254-acre acquisition boundary, but would plan no additional active management of these lands. Oil and gas operations would continue under current special use permits, with little opportunity to prevent potential risks of spills. There would be no water quality surveys or pollution prevention measures for improving or providing increased protection of refuge lands and water. An archaeological survey to determine if there are any cultural resources present would be used in planning for land protection.

Under this alternative, a limited amount of deer, duck, and small game hunting would continue and the refuge would maintain current recreational fishing. The current facilities for wildlife observation and photography, such as the observation tower, nature trails, and wildlife drive pull-offs, would be maintained and enhanced. Environmental education and interpretation requests would be increased and would be accommodated when staff is available. Current kiosks and displays would be maintained and enhanced.

The refuge would operate with the current level of staff in addition to a park ranger (interpretive). Law enforcement of refuge regulations and protection of wildlife and visitors would continue at current levels.

**Table 8. Comparison of Alternatives for the Catahoula National Wildlife Refuge**

<b>Goals and Objectives</b>	<b>Alternative A (Current Management – No Action)</b>	<b>Alternative B (Active Management – Proposed)</b>	<b>Alternative C (Minimal Management)</b>
<b><i>Goal 1: Conserve, restore, and enhance the ecological diversity and abundance of migratory birds and other indigenous fish and wildlife.</i></b>			
<i>Objective 1-1: Wintering Waterfowl</i>	When possible support Louisiana Step-Down Objectives and NAWMP goals. Maintain current level of surveys with State of Louisiana.	Support Louisiana Step-Down objectives and NAWMP. Conduct surveys in conjunction with state and flyway.	Louisiana Step-Down Objective and NAWMP would not be met. Maintain current necessary surveys.
<i>Objective 1-2: Nesting/Resident Waterfowl</i>	Maintain a minimum of 100 nest boxes. When staff is available meet annual banding quota.	Increase and maintain nest box program to support a minimum of 100 nest boxes. Annually exceed banding quota.	Leave 100 boxes in place with no management. Banding quotas would not be met.

<b>Goals and Objectives</b>	<b>Alternative A (Current Management – No Action)</b>	<b>Alternative B (Active Management – Proposed)</b>	<b>Alternative C (Minimal Management)</b>
<i>Objective 1-3: American Woodcock</i>	When possible support woodcock management plan. No surveys conducted for woodcock.	Support Woodcock Management Plan. Conduct surveys. Increase management activities to benefit woodcock.	Woodcock foraging habitat would decline as forest matures. No surveys conducted for woodcock.
<i>Objective 1-4: Marshbirds</i>	No active marshbird management. No surveys.	Provide habitat to support 50 breeding pairs of king rails when possible. Survey and monitor.	Same as Alternative A.
<i>Objective 1-5: Long-legged Waders</i>	No active long-legged wader management. No harassment around rookeries.	Actively manage and maintain long-legged waders' roosting and foraging habitat. Survey and monitor rookeries.	Same as Alternative A.
<i>Objective 1-6: Shorebirds</i>	Maintain habitat for southbound migratory birds. No consistent surveys.	Maintain, increase, and improve (minnow pond area) migration habitat for southbound and northbound migratory birds. Conduct surveys. Support Shorebird National Plan.	No active management for shorebirds. No surveys.
<i>Objective 1-7: Grassland Birds</i>	Maintain current Christmas bird count and volunteer survey. When possible, maintain 95-acre Willow Lake grassland area for priority grassland bird species.	Monitor and survey grassland bird populations. Maintain and manage 95 acres of grassland habitat for high-priority grassland bird species. Work with NRCS to plant native warm season grasses. Develop fire management plan.	Leave 95-acre Willow Lake field fallow and it will most likely return to bottomland hardwood forest.

<b>Goals and Objectives</b>	<b>Alternative A (Current Management – No Action)</b>	<b>Alternative B (Active Management – Proposed)</b>	<b>Alternative C (Minimal Management)</b>
<i>Objective 1-8: Forest Breeding Birds</i>	No active management of bottomland hardwood forests. Maintain forest breeding bird survey.	Actively manage bottomland hardwood forests for forest breeding birds. Work with partners to support Forest Breeding Bird National Plan. Increase surveys and monitoring using point counts in conjunction with forest monitoring.	Same as Alternative A.
<i>Objectives 1-9 and 1-10: Threatened and Endangered Species</i>	Support Southeast Regional Bald Eagle Management Guidelines when nests are encountered. Not currently part of Black Bear Conservation Committee (BBCC).	Provide secure nesting and roosting sites for bald eagles. Support Southeast Regional Bald Eagle Management Guidelines. Actively participate on BBCC team and provide corridor habitat.	Same as Alternative A.
<i>Objective 1-11: Mammals- Wildlife Diversity/ Resident Wildlife</i>	Actively manage bottomland hardwood forest as resources are available.	Maintain habitats for diversity of resident wildlife. Manage and improve bottomland hardwood forest habitat for deer. Initiate browse surveys. Initiate general resident wildlife population surveys.	No active management for resident wildlife.
<i>Objective 1- 12: Invasive/ Nuisance Wildlife</i>	Continue invasive/nuisance wildlife control when possible.	Trap and control furbearer populations. Develop integrated management plan, especially for feral hogs.	No active invasive/nuisance wildlife control program.
<i>Objective 1-13: Amphibians and Reptiles</i>	Continue aural surveys for calling male anuran amphibians as resources become available. No active management.	Inventory and assess populations and habitat for amphibians and reptiles. Actively manage bottomland hardwood forests for key species.	No active amphibian and reptile surveys or management.

Goals and Objectives	Alternative A (Current Management – No Action)	Alternative B (Active Management – Proposed)	Alternative C (Minimal Management)
<i>Objective 1-14: Fisheries</i>	No active management of fisheries other than manipulating current water control structure to avoid fish loss.	Improve habitat in 500 to 1,000 acres of the refuge for the benefit of sport fish. Manage one or more of the Bushley Bayou ponds to yield approximately 100-500 pounds of crawfish per acre. Conduct fish surveys.	Same as Alternative A, but with no water management.
<b><i>Goal 2: Restore, manage, and enhance the functions and values associated with diverse bottomland hardwood forests, open wetlands, and grassland habitats in order to achieve refuge purposes and wildlife population objectives.</i></b>			
<i>Objective 2-1: Bottomland Hardwood Forests</i>	Active management of the current 8,599 acres when possible.	Conduct forest stand inventory and develop management plan in existing and reforested bottomland hardwood forests to determine rotation schedule between units for forest management activities.	No active management in current and reforested (22,467 acres) bottomland hardwood forests or any additional passive reforestation.
<i>Objective 2-2: Open Wetland Habitats (Moist-soil)</i>	Maintain 580 acres as moist-soil habitat on refuge.	Same as Alternative A, with the addition of reassessing habitat goals based on re-calculated LMVJV foraging habitat objectives. Develop water management plan that includes monitoring and managing for food production.	No active management in moist-soil units, with 580 acres most likely reverting to bottomland hardwood forest.
<i>Objective 2-3: Grasslands</i>	Maintain, when possible, 95-acre Willow Lake grassland area for priority grassland bird species.	Manage and maintain 95-acre Willow Lake grassland area for priority grassland bird species. Work with NRCS to plant native warm-season grasses. Develop fire management plan.	Leave 95-acre Willow Lake field fallow and it will most likely revert to bottomland hardwood forest.

Goals and Objectives	Alternative A (Current Management – No Action)	Alternative B (Active Management – Proposed)	Alternative C (Minimal Management)
<b>Goal 3: Conserve natural and cultural resources through partnerships, protection, and land acquisition programs.</b>			
<i>Objectives 3-1: and 3-2: Land Protection/ Refuge Expansion Needs</i>	Maintain current refuge and acquisition boundary. Pursue purchase from willing sellers within current acquisition boundary.	Acquire or exchange lands with willing inholding landowners and seek to expand current acquisition boundary by 2,824 acres to improve access for the public and employees.	Same as Alternative A.
<i>Objective 3-3: Oil and Gas</i>	Maintain current special use permits for current and future facilities.	Work with operators to remedy risks of spills and reduce noise, air, soil, and water pollution. Incorporate special use permits whenever possible and provide monitoring of operations for first alert in spill events.	Same as Alternative A.
<i>Objective 3-4: Pollution Prevention</i>	No current prevention measures.	Work with Ecological Services to establish and implement protocols for baseline and episodic air, soil, sediment, tissue, and water quality contamination.	Same as Alternative A.
<i>Objective 3-5: Cultural Resources</i>	Two partial cultural/archaeological surveys have been conducted.	Conduct a comprehensive archaeological survey. Develop a GIS layer for archaeological and historic sites. Form partnership with nearby tribe for interpretation of archaeological sites.	Same as Alternative B.
<i>Objective 3-6: Water Quality</i>	No current water quality surveys.	Develop baseline data by sampling soils and water. Work with NRCS to contact adjacent landowners and implement conservation buffers to reduce contaminant input to refuge lakes.	Same as Alternative A.

Goals and Objectives	Alternative A (Current Management – No Action)	Alternative B (Active Management – Proposed)	Alternative C (Minimal Management)
<b>Goal 4: To have visitors and local communities value the refuge and balanced wildlife-dependent recreation, leading to a greater appreciation of fish and wildlife resources.</b>			
<i>Objective 4-1: Hunting</i>	Maintain current deer archery, muzzleloader, and gun seasons; waterfowl season; squirrel and rabbit seasons; and rail and gallinule, snipe, and woodcock seasons.	Monitor wildlife populations with survey, harvest data, and health checks and manage the hunt program to achieve wildlife habitat objectives. Provide handicap-accessible blinds, enhance the youth hunt program, and enhance refuge access for hunting.	Restrict all hunting programs by reducing number of days each season is open.
<i>Objective 4-2: Fishing</i>	Maintain current recreational fishing program on Cowpen Bayou and Highway 28 borrow pits, Muddy Bayou, Duck Lake, Willow Lake, Highway 84 borrow pits and all other refuge waters as outlined in fishing brochure.	Improve public access to bank fishing at Willow Lake, Duck Lake, and Bushley Creek. Improve handicap parking and approach to pier on Cowpen Bayou and dock on Duck Lake. Evaluate feasibility of boat ramps in appropriate areas.	Same as Alternative A unless access is limited.
<i>Objective 4-3: Wildlife Observation and Photography</i>	Maintain current facilities on Headquarters Unit.	Replace the observation tower and boardwalk and add a spotting scope and interpretive panel; develop an observation tower and platform at the end of the nature trail. Create short trails to Duck Lake. Develop pull-offs at key viewing spots on Wildlife Drive.	Same as Alternative B.
<i>Objectives 4-4 and 4-5: Environmental Education and Interpretation</i>	Respond to environmental education/interpretation requests when staff is available. Maintain existing kiosks and interpretive displays.	Develop outdoor classroom to support environmental education based curriculum in local school; host annual teacher workshop. Correlate educational activities in critter crates with standards of learning.	Same as Alternative B.

<b>Goals and Objectives</b>	<b>Alternative A (Current Management – No Action)</b>	<b>Alternative B (Active Management – Proposed)</b>	<b>Alternative C (Minimal Management)</b>
<i>Objective 4-6: Facilities and Support</i>	Maintain current facilities on Headquarters Unit.	Expand office facility to accommodate environmental education and interpretive displays. Develop a volunteer program that better supports refuge goals, such as sponsoring a hunt program for disabled hunters; the wood duck box project; off-site education; and trail maintenance.	Same as Alternative B.
<b><i>Goal 5: Provide administrative support to ensure that the goals and objectives for refuge fish and wildlife populations, habitats, land conservation, and visitor services are achieved.</i></b>			
<i>Objective 5-1: Staffing and Budget Needs</i>	Maintain current level of staffing.	Increase staffing by adding a biologist, forester, park ranger (law enforcement), engineering equipment operator, assistant refuge manager, maintenance worker, and park ranger (interpretive).	Increase staffing by adding one full-time position of park ranger (interpretive).
<i>Objective 5-2: Law Enforcement</i>	Maintain current level of law enforcement.	Increase level of law enforcement by adding one full-time park ranger and maintaining dual function officers for effective resource protection, visitor safety, and to enforce compliance with regulations.	Same as Alternative A.

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## *IV. Environmental Consequences*

### **OVERVIEW**

This section analyzes and discusses the potential environmental effects or consequences that can be reasonably expected with the implementation of each of the three management alternatives described in Section III of this environmental assessment. These topics were chosen based on the important issues and concerns raised at the public scoping meeting and the planning team meetings.

However, a few potential effects will be the same under each alternative and are summarized in the following section.

### **EFFECTS COMMON TO ALL ALTERNATIVES**

#### *COMPATIBLE USES*

The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy refuge system lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use "...will not materially interfere with or detract from the fulfillment of the mission of the refuge system or the purposes of the refuge." "Wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety."

An interim compatibility determination is a document that assesses the compatibility of an activity from the time the Service first acquires a parcel of land to the time a formal, long-term management plan for that parcel is prepared and adopted. The Service has completed an interim compatibility determination for the six priority general public uses of the system, as listed in the National Wildlife Refuge System Improvement Act. These uses are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

#### *ENVIRONMENTAL JUSTICE*

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

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

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## *CLIMATE CHANGE IMPACTS*

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

The increase in carbon within the earth's atmosphere has been linked to the gradual rise in surface temperature commonly referred to as global warming. In relation to comprehensive planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact to be considered in planning. The U.S. Department of Energy's *Carbon Sequestration Research and Development* (U.S. DOE 1999) defines carbon sequestration as "...the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

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

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

## *OTHER MANAGEMENT*

All management activities that could affect natural resources, including subsurface mineral reservations, soil, water, and air, and historical and archaeological resources, as well as utility lines and easements, would be managed to comply with all laws and regulations.

## *CULTURAL RESOURCES*

The Fish and Wildlife Service is responsible for managing archaeological and historic sites found on federal land. There have been limited cultural resource surveys to document archaeological, historic structures, or ethnographic resources on the refuge lands. Therefore, it is unknown if there are any unidentified resources within the refuge's boundaries. It remains a possibility because the area in general is known to contain prehistoric cultural resources, such as earthen mounds.

Prior to all habitat and facility maintenance activities, appropriate efforts would be made to identify known and possible cultural resources within the area of potential impact. Avoidance of cultural resources would be the preferred treatment, and mitigation of any impacts would be undertaken if impacts could not be avoided.

## *LAND ACQUISITION*

Funding for land acquisition from willing sellers within the acquisition boundary of the refuge would come from the Land and Water Conservation Fund, Migratory Bird Conservation Fund, Army Corps of Engineers mitigation programs, or donations from conservation and private organizations. Conservation easements and leases could be used to obtain minimum interests necessary to satisfy refuge objectives if the refuge staff can adequately manage uses of the areas for the benefit of wildlife. The Service can negotiate management agreements with local, state, and federal agencies,

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and accept conservation easements. Some tracts within the proposed refuge acquisition boundary may be owned by other public or private conservation organizations. The Service would work with interested organizations to identify additional areas needing protection and provide technical assistance if needed. The acquisition of private lands is entirely contingent on the landowners and their willingness to participate.

#### *REFUGE REVENUE SHARING*

Annual refuge revenue sharing payments to LaSalle and Catahoula Parishes would continue at similar rates under each alternative. If lands were acquired and added to the refuge, the payments would increase accordingly.

#### *VISITOR SERVICES*

As the refuge's visitor services program is developed, the staff would continue to assess the program and its potential impact on refuge resources. Changes in the program would be implemented as needed to address any impacts identified and to respond to anticipated wildlife population increases. To ensure a quality wildlife-dependent recreation experience while achieving the "wildlife first" mandate, the number of users and conflicts among users may be limited by the following: (1) limited permits; (2) designated roads, trails, and sites for specific kinds of wildlife-dependent recreational use; and (3) permitted uses at certain times of the year.

There are a number of purposes for which future refuge closures or restrictions on access may be warranted. Examples of these situations include, but are not limited to, the following: protecting endangered species; protecting nesting birds; restricting recreational activities to achieve specific wildlife population objectives; improving the quality of hunting experiences; minimizing conflicts with other refuge management programs; and limiting activities due to inadequate resources to administer uses.

#### *REFUGE ADMINISTRATION*

The maintenance and operation of the refuge's administrative facilities would continue, regardless of the alternative selected. Periodic updating of facilities is necessary for safety, accessibility, and to support staff and management needs. Funding needs have been identified for several projects, including providing additional facilities and equipment to support refuge operation and maintenance.

#### *OTHER EFFECTS*

Each of the alternatives would have similar effects or minimal to negligible effects on soils, water quality and quantity, noise, transportation, human health and safety, children, hazardous materials, waste management, aesthetics, and utilities and public services.

### **DESCRIPTION OF EFFECTS BY ALTERNATIVE**

This section describes the environmental consequences of adopting each refuge management alternative. Table 9 addresses the likely outcomes for specific issues and is organized by broad issues categories.

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## *ALTERNATIVE A – NO ACTION*

Current refuge management would continue under Alternative A. All management actions would be oriented toward achieving the refuge's primary purposes as resources are available.

Current programs would meet with limited success in achieving refuge goals and objectives with regard to habitat and wildlife populations, primarily because of limited ability to actively manage habitats. Bottomland hardwood forests, wetlands, and grasslands would remain essentially unchanged as would the wildlife benefits. Management of these habitats would be contingent on availability of resources.

Alternative A would enable the refuge to meet its migratory and wintering waterfowl habitat objectives as established by the LMVJV as resources are available.

Hunting and fishing would continue to be the major focus for the refuge public use program, with no expansion of current opportunities, which are adequate, but not as expansive as they could be. Current restrictions or prohibitions would remain. Environmental education and wildlife observation and photography would continue at present relatively low levels.

## *ALTERNATIVE B – ACTIVE MANAGEMENT (PROPOSED ALTERNATIVE)*

Under Alternative B, refuge management would provide restoration and management of habitats to the greater benefit of wildlife. Resources would be dedicated to allow for more public use activities.

Under Alternative B, the refuge would meet its step-down waterfowl habitat objectives established by the LMVJV. Management of refuge lands based on data from the surveys and monitoring would provide high-quality habitat for wildlife, particularly migratory and resident birds. In particular, wintering waterfowl, woodcock, marshbirds, and landbirds are expected to benefit from improved planning from science-based decisions. Population of long-legged waders should increase with increased roosting and foraging habitats. Shorebird populations should increase as these birds benefit from improved management and improvements to various habitats on the refuge. Expansion of the wood duck nest box program would likely increase wood duck populations.

Forest management is expected to improve bottomland hardwood forest and reforested areas by promoting movement from single canopy conditions with limited mid-story and understory layers towards activities that achieve structural and plant species diversity.

Increased water management capabilities should increase the quantity and quality of moist-soil habitats for waterfowl. The grasslands in the Willow Lake area would be improved with the replanting of native warm-season grasses.

Wildlife-dependent recreation would be enhanced with additional hunting and fishing opportunities, including youth hunt programs, access for handicap, and better general access. Fishing opportunities would expand as access for bank fishing was improved and management of the fisheries was better integrated into habitat management.

Enhancements to environmental education and interpretation would result from improved displays, an outdoor classroom, an annual teacher's workshop, and educational activities that correspond well with the local school curricula. Replacement of the current observation tower, the addition of a new tower, new and expanded trails, and pull-offs on Wildlife Drive would enhance wildlife observation and photography opportunities. In addition, the office facility would be expanded to accommodate

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environmental education and interpretive displays, and a volunteer program would be developed to support hunts for the disabled, the wood duck box program, off-site environmental education, and trail maintenance.

The refuge would continue to seek acquisition and protection of lands within the current acquisition boundary and would seek to expand the approved acquisition boundary by 2,824 acres. This would improve access for the public and employees.

An archaeological survey to determine if there are any cultural resources present would be conducted to assist in planning for land protection. Under this alternative, refuge resources would also be better protected as staff works with oil and gas operators to remedy the risks of spills, monitoring for spill events, and to implement a program with NRCS for conservation buffers on adjacent lands.

Increased staff would allow the refuge wildlife and habitat management goals to support enhanced opportunities for wildlife-dependent recreation and would provide the law enforcement and protection necessary to meet the refuge's purpose.

#### *ALTERNATIVE C – MINIMAL MANAGEMENT*

Various human interventions, such as timber harvesting, grazing, and water management have altered the ecological systems within the refuge. Given these various factors, Alternative C seeks to restore the endemic (native) ecosystem of bottomland hardwood forest to the refuge while minimally meeting the refuge purposes.

Within the 15-year planning horizon for the comprehensive conservation plan, the area would likely start to revert to bottomland hardwood forest with cessation of active management. However, natural succession would be slower and not necessarily be of the composition and structure desired by the refuge.

Grasslands would be left fallow and the 95-acre Willow Lake area would likely revert to bottomland hardwood forest. Most moist-soil units would not be actively managed and 580 acres would likely revert to bottomland hardwood forest. As reversion to bottomland hardwood forest occurs, there is also a high probability that the preexisting forest composition and structure would not return. The refuge, for example, has restored open lands by reforesting with native species that occurred on the site prior to its clearing. However, without active management of these habitats, invasive species, such as the Chinese tallow tree, may become the prevalent species within the new, emerging forest.

Beaver impounding of areas on the refuge would create shallow water areas that would be most favored by scrub species, such as water elm and swamp privet. Buttonbush would also be expected in these areas. While some of this type of habitat is beneficial to wildlife, it would not best achieve the overall goals of the refuge.

Waterfowl populations could use bottomland hardwood forest as it matures; however, the refuge may not meet its Louisiana Step-Down and NAWMP objectives. One hundred wood duck nest boxes would be left in place and there would likely be a decline in wood duck populations. Banding quotas would not be met.

There would be no active management of marshbird, long-legged wader, or shorebird habitat. Populations of these species would be expected to decline or remain the same. Grassland bird species would likely decline as the Willow Lake area reverts to bottomland hardwood forest. Forest breeding birds would be expected to remain the same or decline with no active management of the bottomland hardwood forest.

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The refuge would continue to support Southeast Regional Bald Eagle Management Guidelines when nests are encountered. No decline in the bald eagle population is expected.

The refuge would continue to attempt to acquire land from willing sellers within the current 28,254-acre acquisition boundary, but would plan no additional active management of these lands. Oil and gas operations would continue under current special use permits, with little opportunity to prevent potential risks of spills. There would be no water quality surveys or pollution prevention measures for improving or providing increased protection of refuge lands and water.

An archaeological survey to determine if there are any cultural resources present would be conducted to assist in planning for land protection. There would be no water quality surveys or pollution prevention measures for the goal of improving or providing increased protection of refuge lands and water.

A limited amount of deer, duck, and small game hunting would continue with no improvements or new opportunities. The refuge would maintain current bank and recreational fishing. The increased protection that the refuge affords white-tailed deer could lead to an overabundance, resulting in overbrowsing, which could serve to keep naturally occurring regeneration of the open fields from reestablishing and keep them in an open or semi-open status. This could also lead to increases in nest parasitism from brown-headed cowbirds, which like the open or semi-open areas.

Enhancements to environmental education and interpretation would result from improved displays, an outdoor classroom, an annual teacher's workshop, educational activities that correspond well with the local school curricula, and an expansion of the office facility to accommodate environmental education and interpretive displays. In addition a volunteer program would be developed to assist in leading tours, conducting off-site environmental education, and maintaining trails.

Wildlife observation and photography opportunities would likely improve with the replacement of the observation tower and boardwalk and the addition of a spotting scope, a new interpretive panel, additional trails, and pull-offs along the Wildlife Drive.

Increased staff would allow the refuge to support enhanced opportunities for non-consumptive wildlife-dependent recreation. Enforcement of refuge regulations and protection of wildlife and visitors would continue at current levels, which are not adequate at this time; however, with the reduced hunting seasons, law enforcement coverage may be sufficient.

**Table 9. Comparison of Effects Table**

Issues	Alternative A (Current Management No Action)	Alternative B (Active Management - Preferred)	Alternative C (Minimal Management)
<i>Wintering Waterfowl</i>	Waterfowl populations would not change substantially. May fall short of meeting Louisiana step-down and NAWMP objectives.	Waterfowl populations would likely increase as inventory and monitoring protocols are used for continued improvement to water management activities and as waterfowl sanctuary and moist-soil areas are maintained. Likely to meet Louisiana step-down and NAWMP objectives.	Waterfowl populations may increase over the long-term if bottomland hardwood forests mature. Not likely to meet Louisiana step-down and NAWMP objectives in the long term as moist-soil units revert to bottomland hardwood forest.
<i>Wood Duck</i>	Depending on the consistency of maintaining the habitat and nest box program, the current wood duck population is expected to continue. May meet flyway and state banding quota based on staff availability.	Providing year-round habitat and increased nest box program is likely to increase wood duck populations. Exceed flyway and state banding quota.	Wood duck nest box program likely to deteriorate without management. Banding quotas would not be met.
<i>Woodcock</i>	Depending on the availability of staff to support the Woodcock Management Plan, woodcock populations are either likely to remain the same or decrease.	Woodcock populations likely to increase with the use of survey data to better support the Woodcock Management Plan.	Woodcock population likely to decrease with decline of habitat.
<i>Marshbirds</i>	With no active management, populations of yellow rail and black rail are likely to remain the same and unknown.	Populations likely to increase with additional habitat support and the use of monitoring and survey information for improved management.	With no active management, populations likely to decline.

Issues	Alternative A (Current Management No Action)	Alternative B (Active Management - Preferred)	Alternative C (Minimal Management)
<i>Long-Legged Waders</i>	Populations likely to remain the same and little or no monitoring would occur.	Populations likely to increase as roosting and foraging habitat is actively managed and improved with data from rookery surveys and monitoring.	Populations likely to remain the same and little or no monitoring would occur.
<i>Shorebirds</i>	Habitat would be maintained and populations of southbound migratory birds are expected to remain the same.	Populations of southbound and northbound migratory birds expected to increase with a combination of maintaining, increasing, and improving various portions of refuge habitat.	With no active management of habitat, populations of southbound migratory birds expected to remain the same or decline.
<i>Landbirds</i>	If the Willow Lake grassland areas are maintained, populations of grassland species are likely to remain the same. With no active bottomland hardwood forest management, forest breeding bird populations may decline.	Grassland populations expected to increase with management and monitoring of grassland habitat for priority species and replanting of native grasses.  Forest breeding bird populations are expected to increase with active forest management and improved support of the Forest Breeding Bird National Plan.	Populations of grassland species expected to decline if the Willow Lake area returns to bottomland hardwood forest. Forest breeding bird populations may decline with no active bottomland hardwood forest management.
<i>Threatened and Endangered (T&amp;E) Species (Federal)</i>	Populations likely to remain the same with continued support of Bald Eagle Management Guidelines.	Populations likely to remain the same with continued support of Bald Eagle Management Guidelines and involvement in the Louisiana Black Bear Committee.	Populations likely to remain the same with continued support of Bald Eagle Management Guidelines.

<b>Issues</b>	<b>Alternative A (Current Management No Action)</b>	<b>Alternative B (Active Management - Preferred)</b>	<b>Alternative C (Minimal Management)</b>
<i>Resident Wildlife</i>	Populations of deer expected to remain the same with no active management of bottomland hardwood forest. No monitoring to occur.	Deer population expected to improve with management and improvement of bottomland hardwood forests based on browse surveys. Improved wildlife diversity expected as information from surveys of the general resident population becomes available for better management planning.	With no active monitoring, deer could become overabundant leading to overbrowsing. This may hamper reestablishment of naturally occurring regeneration of open fields.
<i>Invasive Species</i>	Nuisance species are expected to remain the same or increase without an integrated pest management plan, causing habitat degradation.	Habitat expected to improve substantially with an integrated pest management plan and trapping and control of furbearers.	With no active management controls, invasive plants and nuisance wildlife expected to become a greater problem to migratory and resident species of plants and animals. The Chinese tallow tree could become the prevalent species in the emerging forest. Shallow water areas resulting from beaver impoundments could create areas favored by shrub species.
<i>Amphibians and Reptiles</i>	Populations are expected to remain the same.	Populations expected to increase with active management of bottomland hardwood forests for key species. Information from inventories and assessments of current populations expected to have a positive impact for future management planning.	Populations are expected to remain the same.

<b>Issues</b>	<b>Alternative A (Current Management No Action)</b>	<b>Alternative B (Active Management - Preferred)</b>	<b>Alternative C (Minimal Management)</b>
<i>Fisheries</i>	Populations expected to remain the same with continued water control and no other active management.	Improvements to habitat and management of one or more of the Bushley Bayou ponds and Duck Lake expected to benefit sport fishing and increase crawfish populations.	Populations of sport fish and crawfish expected to remain the same or decline with no water management or other active management controls.
<i>Bottomland Hardwood Forest</i>	With current management, quality is expected to remain the same.	Bottomland hardwood forest and reforested areas expected to improve as a management plan for rotation of forest management activities between units is implemented.	Bottomland hardwood forest may be established, but there is also a high probability that the preexisting forest composition and structure would not occur.
<i>Moist-Soil Units</i>	Current 580 acres (on Duck Lake and Bushley Bayou Unit) are expected to increase or improve as resources are available for management.	Acreage expected to increase and improve in quality with changes in management due recalculation of foraging habitat goals and a water management plan that includes managing for food production.	With no active management, 580 acres (on Duck Lake and Bushley Bayou Unit) would be lost if they revert to bottomland hardwood forest.
<i>Grasslands</i>	The current 95 acres in Willow Lake area are expected to remain the same or improve slightly if resources are available for management.	The size of the current 95 acres in the Willow lake area expected to remain the same but improved by planting with native warm-season grasses and managed.	The 95 acres in the Willow Lake area would be lost if they revert to bottomland hardwood forest.

<b>Issues</b>	<b>Alternative A (Current Management No Action)</b>	<b>Alternative B (Active Management - Preferred)</b>	<b>Alternative C (Minimal Management)</b>
<i>Hunting</i>	Opportunities maintained at current levels.	Hunting opportunities would be enhanced with youth programs, access for handicapped, and better general access. The quality of the experience would be improved as survey, harvest, and health check data are integrated into the management program.	In the short term, opportunities for hunting would be restricted.  Access would be limited as certain trails or roads are closed and may revert to bottomland hardwood forest.
<i>Fishing</i>	Maintained at current levels.	Increased and integrated more thoroughly into habitat management.	Maintained at current levels unless access is limited.
<i>Environmental Education and Interpretation</i>	Environmental education and interpretation programs and displays will remain the same.	Environmental education and interpretation programs and displays would be enhanced with an outdoor classroom and annual teacher workshop, as well as with improved educational activities and displays.	Environmental education and interpretation programs and displays would be enhanced with an outdoor classroom and annual teacher workshop, as well as with improved educational activities and displays.
<i>Wildlife Observation and Photography</i>	Maintain current facilities at the Headquarters Unit.	Observation and photography opportunities would be improved substantially by replacing the observation tower and boardwalk, developing an observation tower at the nature trail, creating trails to Duck Lake, and providing pull-offs on Wildlife Drive.	Observation and photography opportunities would be improved substantially by replacing the observation tower and boardwalk, developing an observation tower at the nature trail, creating trails to Duck Lake, and providing pull-offs on Wildlife Drive.

Issues	Alternative A (Current Management No Action)	Alternative B (Active Management - Preferred)	Alternative C (Minimal Management)
<b>Facilities</b>			
<i>Partners, Volunteers, Interns</i>	Remain the same.	Greater cooperation with partners and use of volunteers related to increasing public use of the refuge.	Greater cooperation with partners and use of volunteers related to increasing public use of the refuge.
<i>Contaminants (in water, sediments, fish)</i>	With no buffering from activities in adjacent lands and no effort to reduce the risk of oil and gas operational spills, contamination is expected to remain at its current level.	Decrease due to use of conservation buffers on adjacent lands and remediation of spill risks.	With no buffering from activities in adjacent lands and no effort to reduce the risk of oil and gas spills, contamination expected to remain at its current level.
<i>Siltation</i>	Remain the same.	Decrease due to use of buffers on adjacent lands.	Remain the same.
<i>Land Protection</i>	Remain the same. The protection of additional lands within the current acquisition would occur as resources are available.	Increase due to continued protection of lands within and expansion of current refuge acquisition boundary.	Remain the same. The protection of additional lands within the current acquisition would occur as resources are available and biological need is justified.
<i>Cultural Resources</i>	With limited surveys, knowledge and protection of any existing resources would remain the same.	With a survey of lands for the possible existence of these resources, the level of protection necessary can be better assessed.	With a survey of lands for the possible existence of these resources, the level of protection necessary can be better assessed.

<b>Issues</b>	<b>Alternative A (Current Management No Action)</b>	<b>Alternative B (Active Management - Preferred)</b>	<b>Alternative C (Minimal Management)</b>
<i>Facilities</i>	Maintain current facilities on Headquarters Unit and provide no improvements for program support.	Expand facilities with environmental education and interpretive displays.  Improve program support by developing a volunteer program that would improve hunts for disabled, the wood duck nest box program, off-site education and trail maintenance.	Expand facilities with environmental education and interpretive displays.  Improve program support by developing a volunteer program that would lead tours, provide trail maintenance, and conduct on-site education activities.
<i>Staff</i>	Maintain current staffing levels with little baseline data, continued degradation of habitats, same levels of recreational use, and inadequate protection of wildlife, habitats, and visitors.	Increase staff by adding seven full-time positions: biologist, forester, park ranger (law enforcement), engineering equipment operator, maintenance worker, assistant refuge manager, and a park ranger (interpretive), allowing for surveys and baseline data collection and better protection of habitats and resources.	Increase staffing by adding one park ranger (interpretive), to facilitate increased environmental education and interpretation opportunities.
<i>Law Enforcement</i>	Maintain current level of enforcement and protection.	Increase protection of refuge resources and visitor safety with little to no impact on resource management and maintenance programs.	Maintain current level of enforcement and protection, which is insufficient for visitor safety and land and wildlife protection.

<b>Issues</b>	<b>Alternative A (Current Management No Action)</b>	<b>Alternative B (Active Management - Preferred)</b>	<b>Alternative C (Minimal Management)</b>
<i>Human Health</i>	Continued impacts to water quality through risks of oil and gas spills, siltation and contamination; advisories on fish consumption.	Reduced impacts to water and soil quality as well as from noise and wildlife disturbance by decreasing risks of oil and gas spills and monitoring of operations; decreased contamination migration from adjacent lands.	Reduced impacts to water and soil quality as well as from noise and wildlife disturbance by decreasing risks of oil and gas spills and monitoring of operations; decreased contamination migration from adjacent lands.
<i>Socioeconomic</i>	Continue to have modest positive socioeconomic impacts on surrounding communities from spending, taxes, and visitation/tourism.	Increased benefits to local economy expected from additional staff, improved wildlife diversity, and public use opportunities associated with increased visitation and from improved visitor service programs and facilities.	May continue to have modest positive socioeconomic impacts on surrounding communities from spending, taxes, and some increased benefits to visitation/tourism due to current and some increased public use opportunities.

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## **OTHER NEPA REQUIREMENTS**

In Section 102 (C) (ii) and Section 102 (C) (iv) of the National Environmental Policy Act of 1969 (NEPA), as amended, requires that agencies address unavoidable impacts as well as the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, respectively. NEPA implementing regulations (CFR Part 1500-1508.20 and 1508.25, respectively) also specify the need to identify: (1) unavoidable impacts and mitigation measures; (2) cumulative, direct, or indirect impacts of the proposed action; and (3) short-term versus long-term productivity. The following section addresses these NEPA requirements for the proposed alternative.

### *UNAVOIDABLE IMPACTS AND MITIGATION MEASURES*

Under Alternative A, the no action alternative, there are numerous unavoidable impacts, including law enforcement that is not adequate for protecting any significant visitor use, continued degradation of biological function of native plant communities and wildlife habitat due to exotic plant and nuisance animal invasion, and continued degradation of water quality and soil contamination from oil and gas operations and from runoff from adjacent private lands.

Under Alternative B, the proposed alternative, there are some unavoidable impacts as described in the following sections. These impacts are expected to be minor or short-term in duration. In addition, the refuge would attempt to minimize these impacts, whenever possible. The following sections also describe the measures the refuge would employ to mitigate and minimize potential impacts resulting from the implementation of the proposed alternative.

Under Alternative C, the “no management” alternative, impacts would vary depending on whether the refuge lands returned to preexisting conditions, which certainly would not occur within the 15-year life of the comprehensive conservation plan.

### *WATER QUALITY IMPACTS FROM SOIL DISTURBANCE AND USE OF HERBICIDES*

Soil disturbance and siltation due to water management activities and construction of observation towers, blinds, new trails, expanding existing trails, parking lot improvements, and improving boat ramps are expected to cause temporary, minor, impacts. To further reduce potential impacts, the refuge would use best management practices to minimize erosion of soils into water bodies during these construction activities.

Foot traffic on new and extended foot trails is expected to have a negligible impact on soil erosion. To minimize impacts from public use the refuge would include information on signage for trail users, requesting they remain on trails to avoid causing potential erosion impacts.

Long-term herbicide use for exotic plant control could result in a slight decrease in water quality in areas prone to exotic plant infestation. With proper application this is expected to have a minor impact on the environment, with the benefit of reducing or eliminating exotic plant infestations.

### *WILDLIFE DISTURBANCE*

Disturbance to wildlife is an unavoidable consequence of any public use program, regardless of the activity involved. While some activities, such as wildlife observation, may be less disturbing than others, all preferred public use activities contained in this document have been planned to avoid unacceptable levels of impact.

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The known and anticipated level of disturbance from the proposed alternative is not considered to be significant. Nevertheless the refuge will manage public use activities to reduce impacts. Providing access for fishing opportunities allows the use of renewable natural resource without adversely impacting other resources. Hunting would also be managed with restrictions that ensure minimal impact on other resources. General wildlife observation may result in minimal disturbance to wildlife. If the refuge determines that impacts from the expected additional visitor uses are above the levels that are anticipated, those uses would be discontinued, restricted, or rerouted to other less sensitive areas.

#### *VEGETATION DISTURBANCE*

Negative impacts could result from the creation, extension, and maintenance of trails that require clearing of nonsensitive vegetation. This is expected to be a minor, short-term impact.

Increased visitor use may increase the potential for the introduction of new exotic species into areas when visitors do not comply with boat regulations on access or with requests to stay on trails. The refuge would minimize this impact by providing signage requesting users to stay on trails.

#### *EFFECTS ON ADJACENT LANDOWNERS*

Implementation of the proposed alternative is not expected to negatively affect adjacent landowners. Positive impacts that would be expected include higher property values, less intrusion of invasive exotic plants, and increased opportunities for viewing more diverse wildlife.

Some negative impacts that may occur are a higher frequency of trespass onto adjacent private lands and noise associated with increased traffic. To minimize these potential impacts, the refuge would provide signage and mark refuge boundaries, maintain existing parking facilities, use law enforcement, and provide increased educational efforts at the headquarters office.

#### *LAND OWNERSHIP AND SITE DEVELOPMENT*

Land acquisition efforts by the Service could lead to changes in land and recreational use patterns. The lands selected for acquisition would be maintained in a natural state, managed for native wildlife populations, and opened to wildlife-dependent public use, where feasible.

Potential development of trails and other improvements could lead to minor short-term negative impacts on plants, soils, and some wildlife species. Efforts would be made to use recycled products and environmentally sensitive treated lumber when building the observation towers. All construction activities would comply with the requirements of Section 404 of the Clean Water Act, the National Historic Preservation Act, and Executive Order 11988: Floodplain Management, and other applicable regulatory requirements.

#### *CUMULATIVE IMPACTS*

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

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can “accumulate” spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the

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future. Occasionally, different actions counterbalance one another, partially canceling out each other's effect on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource. Sometimes, the overall effect is greater than merely the sum of the individual effects, such as when one more reduction in a population crosses a threshold of reproductive sustainability and threatens to extinguish the population.

Thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum: there are virtually always some other actions that have affected that resource in some way in the past, or are affecting it in the present, or will affect it in the reasonably foreseeable future. So any assessment of a specific action's effects must in fact be made with consideration of what else has happened to that resource, what else is happening, or what else will likely happen to it.

The refuge is not aware of any past, present, or future planned actions that would result in a significant cumulative impact when added to the refuge's proposed actions as outlined in the proposed alternative.

#### *DIRECT AND INDIRECT EFFECTS OR IMPACTS*

Direct effects are caused by an action and occur at the same time as the action. Indirect effects are caused by the action but are manifested later in time or further removed in distance or causality, but still are reasonably foreseeable.

Implementation of actions for the proposed alternative includes wildlife and population management, resource protection, public use, and administrative programs. These actions would have both direct and indirect effects. For the proposed alternative, for example, improving access to the refuge hunting, fishing, and environmental education and interpretive opportunities would most likely lead to increased public use, a direct effect, which, in turn, would lead to indirect effects such as increased littering, noise, and vehicular traffic.

Other indirect actions that may result from the proposed alternative include: minor and temporary impacts from siltation due to disturbance of vegetation while creating pull-offs on Wildlife Drive, building a new observation tower, expanding the office facility for interpretive displays, expanding or creating new foot trails, and possibly providing additional boat ramps.

#### *SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY*

The habitat protection and management actions planned for the proposed alternative are dedicated to maintaining the long-term productivity of refuge habitats. The benefits of this plan for long-term productivity far outweigh any short-term uses, such as construction of observation towers or creation of new trails. While these activities would have short-term negative impacts, the educational value and associated public support gained from the visitor experience would have long-term benefits for the entire ecosystem. The key to protecting long-term productivity is finding that threshold where public uses do not degrade or interfere with refuge resources. The long-term benefits to wildlife protection and land conservation far outweigh any short-term impacts due to implementing the proposed alternative.



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## V. Consultation and Coordination

### INTRODUCTION

The Catahoula National Wildlife Refuge comprehensive conservation planning process involved a wide variety of participants, including federal, state, and local governments; universities and other researchers; private nonprofit groups; and local residents. The diversity and input of participants helped guide development of the plan and this environmental assessment. A core planning team led the process, a biological and habitat review team helped develop wildlife and habitat needs, a visitor service team helped develop public use needs, and the public contributed to the process during the scoping period. Section A, Chapter III, describes the public involvement and input into this planning process.

### CORE PLANNING TEAM MEMBERS

The core planning team involved staff from Catahoula National Wildlife Refuge, Louisiana Department of Wildlife and Fisheries, and Central Louisiana National Wildlife Refuge Complex. This team was the primary decision-making team for the comprehensive conservation plan. Key tasks of the team involved defining and refining the vision; identifying, reviewing, and filtering issues; defining the goals; and outlining the alternatives. The team members included:

- Andrew Hammond, Refuge Manager, Catahoula NWR
- Greg Harper, Refuge Manager, Catahoula NWR
- David Hayden, Wildlife Biologist, Louisiana Department of Wildlife and Fisheries
- Tina Chouinard, Natural Resource Planner, Central Louisiana NWR Complex

### BIOLOGICAL AND HABITAT REVIEW TEAM

The Biological and Habitat Review Team consisted of Service staff and invited participants. The invited participants included local and regional experts, researchers, and individuals with intimate knowledge of and expertise in the biological resources of the refuge. Members of the review team included:

- Andrew Hammond, Refuge Manager, Fish and Wildlife Service
- Greg Harper, Refuge Manager, Fish and Wildlife Service
- Tina Chouinard, Natural Resource Planner, Fish and Wildlife Service
- Pat Stinson, Wildlife Biologist, Forester, Fish and Wildlife Service
- Charles Guillory, Soil Scientist, Natural Resources Conservation Service
- Steve Cruse, State WRP Coordinator, Natural Resources Conservation Service
- John Pitre, State Biologist, Natural Resources Conservation Service
- Buddy Dupuy, Forester, Louisiana Department of Wildlife and Fisheries
- Chuck Hunter, Regional Refuge Biologist, Fish and Wildlife Service
- Susan Walls, Amphibian Ecologist, U.S. Geological Survey
- John Forester, Fish Biologist, Fish and Wildlife Service
- Scott Durham, Waterfowl Biologist, Louisiana Department of Wildlife and Fisheries
- John Dickson, Private Land Biologist, Fish and Wildlife Service
- Buddy Goatcher, Contaminants Specialist, Fish and Wildlife Service
- John Simpson, Forester, Fish and Wildlife Service
- David Hayden, Biologist, Louisiana Department of Wildlife and Fisheries

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## **VISITOR SERVICES REVIEW TEAM**

The Visitor Services Review Team consisted of staff from the Service's Southeast Regional Office, Central Louisiana National Wildlife Refuge Complex, and White River National Wildlife Refuge. Members of the review team included:

- Garry Tucker, Visitor Services and Outreach, Regional Office
- Ray Paterra, White River NWR
- Tina Chouinard, Central Louisiana NWR Complex

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**SECTION C. APPENDICES**

## *Appendix I. 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	A set of objectives and strategies needed to achieve refuge goals and the desired future condition.
Approved Acquisition Boundary	A project boundary which the Director of the Fish and Wildlife Service approves upon completion of the detailed planning and environmental compliance process.
Biological Diversity	The variety of life forms and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
Biological Integrity	The biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions including the natural biological processes that shape genomes, organisms, and communities.
Code of Federal Regulations (CFR)	The codification of the general and permanent rules listed in the Federal Register by the executive departments and agencies of the Federal Government.
Community	An interacting population of various kinds of individuals (as species) in a common location.
Compatible Use	A wildlife-dependent recreational use or any other use on a refuge that will not materially interfere with or detract from the fulfillment of the mission of the Service or the purposes of the refuge.
Comprehensive Conservation Plan (CCP)	A document that describes the desired future conditions of the refuge and specifies management actions to achieve refuge goals and the mission of the National Wildlife Refuge System.
Community	A distinct assemblage of plants that develops on sites characterized by particular climates and soils, and the species and populations of wild animals that depend on the plants for food, cover, and/or nesting.

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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.
Corridor	A route that allows movement of individuals from one region or place to another.
Cover Type	The present vegetation of an area.
Cultural Resources	The remains of sites, structures, or objects used by people of the past.
Cypress and Tupelo Swamp	A swamp found in low-lying areas that holds water several months, if not all of the year. Large hollow trees are used as bear den sites.
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 interrelated complex of plant and animal communities and their associated non-living environment.
Ecosystem Approach	A strategy or plan to protect and restore the natural function, structure, and species composition of an ecosystem, recognizing that all components are interrelated.
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	Edge or transition zone between two or more adjacent but different plant communities, ecosystems, or biomes.
Endangered Species	Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range.
Environmental Assessment (EA)	A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.
Extirpation	The localized extinction of a species that is no longer found in a locality or country, but still exists elsewhere in the world.
Federal Trust Species	All species for which the Federal Government has primary jurisdiction, including federally threatened or endangered species, migratory birds, anadromous fish, and certain marine mammals.

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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 and supported by an environmental assessment that briefly presents why a Federal action will have no significant effect on the human environment and states that an environmental impact statement, therefore, will not be prepared.
Floodplain Woods/ Bottomland Hardwood Forests	Forests consisting of hardwood species adapted to heavy clay soils and frequent/seasonal inundation. Such forests occur naturally in the alluvial flood plains of rivers and streams in the southeastern United States but millions of acres (up to 90 percent) have been cleared primarily for agriculture in the Mississippi River Alluvial Valley.
Fragmentation	The process of reducing the size and connectivity of habitat patches; the disruption of extensive habitats into isolated and small patches.
Goals	Descriptive statements of desired future conditions.
Habitat	The place where an organism lives. The existing environmental conditions required by an organism for survival and reproduction.
Historic Conditions	The composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.
Inholding	Privately owned land inside the boundary of a national wildlife refuge.
Issue	Any unsettled matter that requires a management decision.
Mississippi Alluvial Plain	A conspicuous band of alternating Pleistocene and Holocene deposits that characterizes the broad, flat alluvial plain of the Mississippi River embayment, its tributaries to the west, and coastal Texas.
Moist-soil Management	The technique of using water management structures in seasonally flooded impoundments to stimulate the production of natural plant species on exposed mudflats by regulating the timing of water removal in the spring.

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National Environmental Policy Act of 1969	A Federal law that 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	A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System.
National Wildlife Refuge System	All lands, waters, and interests therein administered by the Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish, wildlife, and plant resources.
Neotropical Migratory Bird	A bird species that breeds north of the United States/Mexican border and winters primarily south of that border.
Objectives	Actions to be accomplished to achieve a desired outcome or goal. Objectives are more specific, and generally more measurable, than goals.
Planning Area	An area that may include lands outside existing planning unit boundaries that are being studied for inclusion in the unit and/or 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.
Preferred Alternative	This is the alternative determined by the decision maker to best achieve the refuge purpose, vision, and goals; contributes to the Refuge System mission, addresses the significant issues; and is consistent with principles of sound fish and wildlife management.
Purpose of the Refuge	The purpose of the refuge is 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 and refuge unit.
Refuge Operating Needs System	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.

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Scoping	A process for determining the scope of issues to be addressed by a comprehensive conservation plan and for identifying the significant issues. Involved in the scoping process are federal, state and local agencies; private organizations; and individuals.
Seral Forest	A forest in the mature stage of development, usually dominated by large, old trees.
Sink	A habitat in which local mortality exceeds local reproductive success for a given species.
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.
Species	A distinctive kind of plant or animal having distinguishable characteristics, and that can interbreed and produce young. In taxonomy, a category of biological classification that refers to one or more populations of similar organisms that can reproduce with each other but is reproductively isolated from – that is, incapable of interbreeding with – all other kinds of organisms.
SPOA	Source Population Objective Area.
Strategies	A general approach or specific actions to achieve objectives.
Step-Down Management Plans	Step-down management plans provide the details necessary to implement management strategies and projects identified in the comprehensive conservation plan.
Threatened Species	Those plant or animal species likely to become endangered species throughout all of or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.
Trust Species	Species for which the Fish and Wildlife Service has primary responsibility, including most federally listed threatened and endangered species, anadromous fish once they enter the inland coastal waterways, and migratory birds.
Vegetation	Plants in general, or the sum total of the plant life in an area.
Vegetation Type	A category of land based on potential or existing dominant plant species of a particular area.
Watershed	The entire land area that collects and drains water into a stream or stream system.

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Wetland	Areas such as lakes, marshes, bogs, and streams that are inundated by surface or ground water for a long enough period of time each year to support, and that do support under natural conditions, plants and animals that require saturated or seasonally saturated soils.
Wetland Reserve Program	A voluntary program of the USDA Natural Resources Conservation Service that provides technical and financial support to help landowners and agencies with their wetland restoration efforts.
Wildlife	Living things, especially mammals, birds, and fishes that are neither human nor domesticated.
Wildlife Corridor	A landscape feature that facilitates the biologically effective transport of animals between larger patches of habitat dedicated to conservation functions. Such corridors may facilitate several kinds of traffic, including frequent foraging movement, seasonal migration, and the once-in-a-lifetime dispersal of juvenile animals. These are transition habitats and need not contain all the habitat elements required by migrants for long-term survival or reproduction.
Wildlife-dependent Recreational Use	A use of the refuge that involves hunting, fishing, wildlife observation, wildlife photography, or environmental education and interpretation, as identified in the National Wildlife Refuge System Improvement Act of 1997.
Wildlife Diversity	A measure of the number of wildlife species in an area and their relative abundance.

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## *Appendix II. References and Literature Citations*

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## *Appendix III. Relevant Legal Mandates*

### **NATIONAL WILDLIFE REFUGE SYSTEM AUTHORITIES**

The mission of the Fish and Wildlife Service is to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of the American people. The Service is the primary Federal agency responsible for migratory birds, endangered plants and animals, certain marine mammals, and anadromous fish. This responsibility to conserve our nation's fish and wildlife resources is shared with other Federal agencies and State and Tribal governments.

As part of this responsibility, the Service manages the National Wildlife Refuge System. This system is the only nationwide system of Federal land managed and protected for wildlife and their habitats. 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.

Catahoula National Wildlife Refuge is managed as part of this system in accordance with the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, the Refuge Recreation Act of 1962, Executive Order 12996 (Management and General Public Use of the National Wildlife Refuge System), and other relevant legislation, executive orders, regulations, and policies.

### **KEY LEGISLATION/POLICIES FOR PLAN IMPLEMENTATION**

The Catahoula National Wildlife Refuge Draft Comprehensive Conservation Plan describes and illustrates management area projects with standards and guidelines for future decision making and may be adjusted through monitoring and evaluation, as well as amendment and revision. The plan approval establishes conservation and land protection goals, objectives, and specific strategies for the refuge and its expansion. Compatible recreation uses specific to the refuge have been identified and approved by the refuge manager. This plan provides for systematic stepping down from the overall direction as outlined when making project- or activity-level decisions. This level involves site-specific analysis (e.g., Forest Habitat Management Plan) to meet National Environmental Policy Act requirements for decision making.

The legal mandates supporting the National Wildlife Refuge System are as follows:

**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.

**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.

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

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

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 uses.

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.

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

National Environmental Policy Act (1969): Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

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.

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

Executive Order 11988 (1977): Requires every Federal agency to provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and to conserve the natural and beneficial values served by the floodplain.

Executive Order 11990: Directs Federal agencies to (1) minimize destruction, loss, or degradation of wetlands and (2) conserve and enhance the natural and beneficial values of wetlands when a practical alternative exists.

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."

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

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

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 Refuge System.

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.

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Emergency Wetland Resources Act of 1986: This Act authorized the purchase of wetlands from Land and Water Conservation Fund monies, 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 that implement it; and authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction of anyone violating the Act and any regulation issued thereunder.

Environmental Education Act of 1990 (20 U.S.C. 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 11888, Floodplain Management: The purpose of this executive order, signed May 24, 1977, is to prevent Federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of floodplain 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.”

Fish and Wildlife Improvement Act of 1978: This Act was passed to improve the administration of fish and wildlife programs. It 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.

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*HISTORIC PRESERVATION ACTS INCLUDE:*

- 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.
- 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.
- 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, and/or transferred funds for the recovery, protection, and preservation of such data.
- Historic Sites, Buildings, and Antiquities Act (16 U.S.C. 461-462, 464-467)--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. 468-468d).

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.

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- 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, authorizes the opening of part of a refuge to waterfowl hunting and 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.
  - 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- and/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.
  - Native American Graves Protection and Repatriation Act (1990): Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.
  - 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.
  - 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.

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- National Wildlife Refuge System Improvement Act of 1997 (Refuge Administration Act), Public Law 105-57, amends the National Wildlife Refuge System Act of 1966 (16 U.S.C. 668dd-ee) and provides guidance for management and public use of the Refuge System. The 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. It 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 Refuge Improvement Act clearly defines a unifying mission for the Refuge System. It establishes the legitimacy and appropriateness of the six priority public uses (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. The Act establishes a formal process for determining compatibility; 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). The Act establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a comprehensive conservation plan for each refuge by the year 2012. 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 is 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 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 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.

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- 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 to the Refuge Revenue Sharing Act 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 payment 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.



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## *Appendix IV. Public Involvement*

### *PUBLIC INVOLVEMENT PROCESS*

Public involvement in the development of the Comprehensive Conservation Plan and Environment Assessment for Catahoula National Wildlife Refuge, in La Salle and Catahoula Parishes, Louisiana, was sought throughout the planning process. A planning team (refer to Section B, Chapter V), composed of representatives from various Service divisions, was formed to prepare the Draft Plan and Environmental Assessment. Initially, the team focused on identifying the issues and concerns pertinent to refuge management. The team met on several occasions from February 2005 to September 2005.

In preparation for developing the Draft Plan, a Wildlife and Habitat (Biological) Review was conducted on Catahoula Refuge during the week of October 25-27, 2004, by a team of Service biologists, managers, foresters, and non-service managers/biologists (refer to Section B, Chapter V). A Visitor Service Review Report was completed in November 2004. Public input to the development of the Draft Plan was initiated through a notice of intent published in the Federal Register on March 2, 2005, (70 FR 10109). To expand the range of issues and generate potential alternatives, public input to the development of the Draft Plan was sought through a public scoping meeting held on March 22, 2005, at Jena Elementary School, Jena, Louisiana. At the meeting, interested stakeholders were able to register their concerns to ensure that they would be considered in developing the CCP. The meeting was publicized by a press release in the local papers in Jena, Jonesville, and Alexandria. There were 34 attendees at the meeting, and seven meeting attendees provided public comment. Seven citizens sent comment letters to the refuge.

The issues and alternatives generated from these meetings, coupled with the input of the planning team, are summarized in Chapters I and III of the Draft Plan. The Draft Plan, when approved by the Fish and Wildlife Service, will direct management of the refuge over a 15-year period.



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## Appendix V. Compatibility Determinations

*Uses:* The following uses were considered for compatibility determination reviews: hunting, fishing, wildlife observation and photography, environmental education and interpretation, all-terrain vehicle use, refuge resource research studies, boating, forest management program, and trapping of selected furbearers and feral hogs. A description and anticipated biological impacts for each use are addressed separately in this appendix.

*Refuge Name:* Catahoula National Wildlife Refuge

*Date Established:* 1958.

*Establishing and Acquisition Authority:* The refuge was established in 1958 under the authority of the Migratory Bird Conservation Act, which calls for:

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

and the Fish and Wildlife Act of 1956, which calls for:

"... the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f (a) (4) "...the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. § 742f (b) (1) (Fish and Wildlife Act of 1956).

*Refuge Purposes:* With these establishing authorities, purposes for the Headquarters Unit of Catahoula Refuge were further refined as the following:

- To provide migrating and wintering habitat for migratory waterfowl consistent with the overall objectives of the Mississippi Flyway;
- To provide habitat and protection for threatened and endangered species;
- To manage bottomland hardwoods and provide habitat for a natural wildlife diversity; and
- To provide opportunities for wildlife-oriented recreation, interpretation, and environmental education for 40,000 visitors annually.

Purposes for the Bushley Bayou Unit of Catahoula Refuge were further refined in the 1999 Environmental Assessment, FONSI, and Land Protection Plan, prepared by the Service as the following:

- To provide habitat for wintering waterfowl and woodcock;
- To provide nesting habitat for wood ducks;
- To provide habitat for a natural diversity of wildlife;
- To provide habitat for nongame, neotropical migratory birds; and
- To provide opportunities for wildlife-dependent recreation, interpretation, and environmental education.

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*National Wildlife Refuge System Mission:*

The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, 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)  
Migratory Bird Treaty Act of 1918 (15 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 Stamp Act of 1934 (16 U.S.C. 718-178h; 48 Stat. 451)  
Criminal Code Provisions of 1940 (18 U.S.C. 41)  
Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; 54 Stat. 250)  
Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41; 62 Stat. 686)  
Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)  
Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)  
Wilderness Act (16 U.S.C. 1131; 78 Stat. 890)  
Land and Water Conservation Fund Act of 1965  
National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.; 80 Stat. 915)  
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd, 668ee; 80 Stat. 927)  
National Environmental Policy Act of 1969, NEPA (42 U.S.C. 4321, et seq; 83 Stat. 852)  
Use of Off-Road Vehicles on Public Lands (Executive Order 11644, as amended by Executive Order 10989)  
Endangered Species Act of 1973 (16 U.S.C. 1531 et seq; 87 Stat. 884)  
Refuge Revenue Sharing Act of 1935, as amended in 1978 (16 U.S.C. 715s; 92 Stat. 1319)  
National Wildlife Refuge Regulations for the Most Recent Fiscal Year (50 C.F.R. Subchapter C; 43 C.F.R. 3101.3-3)  
Emergency Wetlands Resources Act of 1986 (S.B. 740)  
North American Wetlands Conservation Act of 1990  
Food Security Act (Farm Bill) of 1990 as amended (HR 2100)  
The Property Clause of the U.S. Constitution Article IV 3, Clause 2  
The Commerce Clause of the U.S. Constitution Article 1, Section 8  
The National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57, U.S.C. 668dd)  
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System. March 25, 1996  
Title 50, C.F.R., Parts 25-33  
Archaeological Resources Protection Act of 1979  
Native American Graves Protection and Repatriation Act of 1990

Compatibility determinations for each description listed were considered separately. Although for brevity, the preceding sections from “Uses” through “Other Applicable Laws, Regulations, and Policies” are only written once within the plan, they are part of each descriptive use and become part of that compatibility determination if considered outside of the comprehensive conservation plan.

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*Description of Use:*

*Hunting*

Catahoula National Wildlife Refuge is a 25,242-acre-refuge, consisting of several different habitat types. Most of the refuge was, at one time, part of a vast bottomland hardwood forest, but was cleared in the late 1960s and early 1970s for agriculture. A mix of reforested fields, moist-soil management units, forested wetlands, sloughs, bayous, and creeks make up the refuge. There is approximately 580 acres of moist-soil units, 1,275 acres of open water, 8,599 acres of bottomland hardwood forest, and 13,868 acres reforested or land reverting back to bottomland species. This mix provides good habitat for a number of game species, including white-tailed deer, squirrels, raccoon, rabbit, woodcock, and waterfowl.

Many of the local residents enjoy an informal, rural lifestyle that includes frequent recreational use of the area's natural resources. Hunting and fishing have been, and continue to be, popular uses of public lands. Hunting has been permitted on the refuge since 1968.

Hunting occurs during state seasons, generally between October and February each year, and follows state regulations. There are additional refuge-specific regulations to supplement state regulations. These refuge-specific regulations are reviewed annually and are incorporated into the refuge hunting brochure and permit that hunters are required to have before hunting on the refuge.

The refuge was established to provide wintering habitat for migratory waterfowl; therefore, it is necessary to maintain existing waterfowl sanctuary areas. These sanctuary areas will be seasonally closed to all activities except archery deer hunting.

Access into the refuge hunt areas will be via hiking, all-terrain vehicle, passenger vehicle, or boat as posted.

*Availability of Resources:* Enforcement of refuge regulations to protect trust resources and to provide for a quality recreational opportunity will occur via regular patrols by refuge law enforcement officers. Currently, the refuge has two collateral duty officers. Additionally, personnel from the Louisiana Department of Wildlife and Fisheries will patrol the refuge and assist refuge officers when needed.

The hunt program at the refuge will cost approximately \$35,000 annually, which includes costs to create and print the hunt brochure, support law enforcement, and create and maintain parking areas and all-terrain vehicle trails. Participation in the hunt program is estimated to be 2,500 visitors annually.

A management agreement with American Electric Power Company provided approximately \$300,000 through The Conservation Fund to fund management activities on the Bushley Bayou Unit. Any additional funding to support the hunt program will be through increases in the refuge budget.

*Anticipated Impacts of the use:* Monitoring of harvests will be accomplished through daily self-clearing check in/out sheets and data collection by refuge staff. This monitoring will provide a way to measure the health of impacted wildlife. If wildlife populations significantly change, that difference will be reflected in the harvest. The long-term impact of hunting will be monitored in the following ways on a yearly basis.

Harvest management of big game (e.g., white-tailed deer) is the art of combining wildlife science and landowner objectives for the attainment of a specific management goal. Whenever possible, harvest management strategies should be based on objectives established as part of hunting plans

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developed for the area. The objective-setting process must be based on a complete analysis of biological data. Specific harvest objectives allow the setting of hunting regulations. Results of each hunting season will be thoroughly evaluated to ensure that the harvest management program remains dynamic and responsive to an evolving management environment (Bookhout 1994).

Harvest management of small game and furbearers (e.g., rabbit, raccoon, and beaver) is considerably different from that of both big game and migratory birds. Current literature suggests that user take (<50 percent of total mortality) of most upland game is compensatory; that factors such as immigration from adjacent areas and density-dependent production operate in most upland game populations; and that hunting does not significantly impact populations. Hunting is substituted for natural mortality. Production of large, annual surpluses of young allow for lengthy seasons and generous bag limits with little concern for overharvest and minimal chance of population impacts in most areas (Bookhout 1994).

Harvest management of migratory birds (e.g., ducks, and woodcock) is more difficult to assess. Migratory bird regulations are established at the federal level each year following a series of meetings involving both state and federal biologists. Harvest guidelines are based on population lengths and framework dates (Bookhout 1994). Schmidt 1993, states, "In general, all studies have demonstrated a high degree of compensation of hunting mortality by other 'natural' mortality factors for harvest levels experienced to date." He also reports, "The proportion of waterfowl populations subject to hunting on refuges is very low; thus hunting is not likely to have an adverse impact on the status of any recognized waterfowl population in North America."

Based on available information, no threatened or endangered species, other than the bald eagle and Louisiana black bear, could potentially use the refuge. It is anticipated that the current levels and expected future levels of hunting or other wildlife-dependent recreation activities would not directly, indirectly, or cumulatively impact any listed, proposed, or candidate species or designated/proposed critical habitat. Data gathered from future biological surveys regarding the importance or potential importance of the refuge to threatened or endangered species or critical habitat (or proposed threatened, endangered, or critical habitat) could result in changes to public use activities across time; however, these changes would have no effect on listed species.

No assessable environmental impact to the refuge, its habitats, or wildlife species is expected by this use. The refuge has been a favorable hunting area to the local community for many years. Concerns primarily center on the possibility of impacting threatened and other sensitive non-target species through excessive disturbance. With restrictions limiting access to specific locations and motorized vehicles in other areas, disturbance is minimized. Restrictions to the hunting program assure that these activities have no adverse impacts on other wildlife species and little adverse impact to other public use programs.

*Public Review and Comment:* The Service posted two times during the year a notice at the headquarters kiosk and in *The Jena Times* and once in *The Catahoula News* seeking public comment on the proposed use. This compatibility determination was prepared with and included in the amended Hunt Plan. Eight positive comments were received in reference to waterfowl hunting on the refuge. In order to update the existing hunting compatibility determination, the Service is soliciting comments by placing copies of the Draft CCP/EA at the public library and the refuge office and holding public meetings during the Draft CCP/EA public comment period. Notices will be posted in the office and news releases sent to all local papers stating the purpose of the Draft CCP and supporting documents and how to submit comments.

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*Determination (check one below):*

Use is Not Compatible

  X   Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

- Hunting would be permitted in accordance with the State of Louisiana regulations and licensing requirements. An environmental assessment is on file at the refuge headquarters as part of the Hunt Plan.
- Time, date, and zone restrictions may vary in the future as refuge boundaries expand and public use demands change.
- Vehicles would be restricted to designated roads. All-terrain vehicles would be restricted to designated trails. Off-road travel would be limited to foot travel only.
- Firearms, bows, and other weapons would be prohibited except during designated hunting seasons.
- Hunting deer with dogs would not be allowed on the refuge. Use of dogs for hunting rabbit, squirrel, waterfowl, and woodcock would be allowed during designated seasons only.
- Sanctuary areas will be maintained and seasonally closed to all uses.
- Camping overnight on the refuge would be prohibited.
- All hunts would be designed to provide quality user opportunities based upon known wildlife population levels and biological parameters. Hunt season dates and bag limits would be adjusted as needed to achieve balanced wildlife population levels within carrying capacities, regardless of impacts to user opportunities.
- As additional data is collected and a long-range hunt plan developed, additional refuge-specific regulations could be implemented. These regulations could include, but may not be limited to, season dates that differ from those in surrounding state zones, refuge permit requirements, and closed areas on a permanent or seasonal basis (to reduce disturbance to specific wildlife species or habitats, such as bird rookeries, wintering waterfowl or threatened/endangered species, or to provide for public safety).

*Justification:* Recreational hunting is one of the six priority public uses made available on national wildlife refuges as indicated by the National Wildlife Refuge System Improvement Act of 1997. This use will allow the visiting public to safely enjoy quality hunting on public land while non-hunting visitors enjoy wildlife observation, photography, hiking, or learning about the natural resources of the area.

Mandatory 15-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*Fishing*

Permit sport fishing on Catahoula National Wildlife Refuge of game fish (e.g., largemouth bass, white crappie, black crappie, bluegill, redear, and sunfish), and rough fish (e.g., channel catfish, blue catfish, flathead catfish, gar, bowfin, carp, freshwater drum, and crawfish). Refuge seasons will fall within the framework of the State of Louisiana seasons, which are established by the Louisiana Department of Wildlife and Fisheries.

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Availability of Resources: Enforcement of refuge regulations to protect trust resources and provide for a quality recreational opportunity will occur via regular patrols by refuge law enforcement officers. Currently, the refuge has two dual-function duty officers. Additionally, personnel from the Louisiana Department of Wildlife and Fisheries will patrol the refuge and assist refuge officers when needed.

The fishing program at the refuge will cost approximately \$25,000 annually, which includes costs to create and print the hunt brochure, support law enforcement, and create and maintain parking areas and all-terrain vehicle trails. Participation in the fishing program is estimated to be 4,500 visitors annually. The refuge is not enrolled in the Fee Demonstration Program.

*Anticipated Impacts of the Use:* No adverse impacts are expected as a result of this use. Seasons will be established with the objective of preventing disturbance to migratory waterfowl.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination* (check one below):

Use is Not Compatible

X  Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* All fishing will be in accordance with State regulations and refuge-specific fishing regulations. On the Headquarters Unit, fishing will be permitted from one hour before sunrise until one-half hour after sunset. Only pole and line or rod and reel fishing will be permitted. All refuge waters except Cowpen Bayou and the Highway 28 borrow pits will be closed to fishing and boating from November 1 through February 28, in order to provide a sanctuary area for migrating birds. Boat motors may not exceed 10 horsepower in size. No boats may be left on the refuge overnight. Boats on trailers may be launched only at designated boat ramps. Dragging boats or driving along road shoulders to launch boats is prohibited. On the Bushley Bayou Unit, fishing will be permitted two hours before official sunset until two hours after official sunset. Recreational fishing and crawfishing is allowed year-round. Only 10 horsepower motors or less are allowed on the interior lakes within the Bushley Bayou Unit. There are no horsepower restrictions on Bushley Creek, Big Bushley Creek, or Little Bushley Creek. Recreational gear (e.g., slat traps, wire nets, and hoop nets) is allowed only by refuge special use permit and only in designated creeks. Trotlines must be tended at least once every 24 hours and reset when exposed by receding water. Trotlines must be attached with a length of cotton line that extends into the water. Trotlines must be removed when not in use. Yo-yos must be attended and used only during daylight hours. Bank fishing is prohibited on Bushley Creek and all fishing is prohibited on Black, Dempsey, Long, Rhinehart, and Round Lakes during deer-gun and deer-muzzleloader hunts and on lakes during waterfowl hunts. Taking, collecting, or disturbing any plant or wildlife other than as specified in refuge regulations are prohibited. Law enforcement efforts on the refuge will ensure compliance with State laws and refuge-specific regulations. All or parts of the refuge may be closed to fishing or crawfishing at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons.

*Justification:* Fishing is identified in the 1997 National Wildlife Refuge System Improvement Act as an activity that should be provided and expanded on refuges. Sport fishing will provide quality, wildlife-dependent recreation to the public and the opportunity to utilize a renewable resource. Providing this recreation is a refuge objective.

Mandatory 15-Year Re-evaluation Date: \_\_\_\_\_

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*Description of Use:*

*Wildlife Observation and Photography*

Non-consumptive wildlife observation uses, such as birdwatching, auto tour routes, hiking, and nature photography, are minimal at this time due to the area's distance from large metropolitan areas and the general lack of access and facilities. It is estimated that 4,200 visits/year are attributed to wildlife observation and related activities.

It is anticipated that an increase in non-consumptive wildlife-dependent uses will occur over the next few years as facilities and access are provided and especially as the public and conservation groups become aware of the excellent birding/wildlife viewing opportunities on the refuge.

*Availability of Resources:* Based on a review of the refuge's budget allocated for this activity, there is adequate funding to ensure compatibility and to administer the use.

*Anticipated Impacts of the Use:* Wildlife observation and photography activities may result in some disturbance to wildlife if visitors venture too close to the bird rookeries. Refuge road systems, foot trails, photo blinds, boardwalks, and wildlife observation platforms will be located to minimize disturbance that could occur in these sensitive areas. If unacceptable levels of disturbance are identified at any time, sensitive sites will be closed to public entry. Some minimal trampling of vegetation also may occur.

Construction of foot trails, boardwalks, observation platforms, and the upgrading of refuge roads and all-terrain vehicle trails will alter small portions of the natural environment. Proper planning prior to construction, sediment retention, and grade stabilization features will reduce negative impacts to wetlands, threatened and endangered species, and species of special concern. Impacts, such as trampling vegetation and wildlife disturbance by refuge visitors, do occur but are presently not significant. Upgrading roads will reduce soil erosion associated with the current dirt roads and trails. Other potential negative impacts are caused by visitors violating refuge regulations, such as littering or illegally taking plants or wildlife. Refuge roads are maintained for habitat and biological management programs and law enforcement. Use of the roads by the public does incur added maintenance costs.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination* (check one below):

Use is Not Compatible

Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* Permits prior to construction will be obtained from local, state, and federal regulatory agencies to reduce the possibility of negatively impacting wetlands, cultural resources, or protected species. Law enforcement patrol of public use areas will continue to minimize violations of refuge regulations. Refuge roads will be closed to the public during extremely wet periods such as flooding to prevent road damage and for visitor safety. Public use for wildlife observation and photography will be monitored to document any negative impacts. If any negative impacts become noticeable, corrective action will be taken to reduce or eliminate the effects on wildlife.

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*Justification:* Wildlife observation and photography are important and preferred public uses on Catahoula National Wildlife Refuge and the National Wildlife Refuge System. The 1997 National Wildlife Refuge System Improvement Act identified wildlife observation and photography as a priority public recreational use to be facilitated on refuges. It is through permitted, compatible public uses such as this that the public becomes aware of and provides support for our national wildlife refuges.

Mandatory 15-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*Environmental Education and Interpretation*

Environmental education and interpretation are those activities which seek to increase the public's knowledge and understanding of wildlife, national wildlife refuges, ecology, and land management, as well as contribute to the conservation of natural resources. Environmental education/interpretation activities have been given only upon request in prior years. In the future, the program will be structured around activities conducted by staff or trained volunteers. The staff will develop and provide curriculum and support materials to area teachers for use both on and off the refuge. Informational kiosks and interpretive panels will be developed at key refuge entrance points, at current interpretive sites, and at the new boardwalk and wildlife observation platform as part of the environmental education/interpretation program.

*Availability of Resources:* No additional fiscal resources are needed to conduct this use. The existing staff can administer, manage, and monitor this use as part of routine management duties.

*Anticipated Impacts of the Use:* Construction of facilities, such as boardwalks, kiosks, and observation platforms, will alter small portions of the natural environment on the refuge. Proper planning and placement of facilities will ensure that wetlands, threatened or endangered species, or species of special concern are not negatively impacted. Proper permits through the parish, state, and federal regulatory agencies will be obtained prior to construction to ensure resource protection. The use of on-site, hands-on, action-oriented activities to accomplish environmental education and interpretive tours may impose a low-level impact on the sites used for these activities. These low-level impacts may include trampling of vegetation and temporary disturbance to wildlife species in the immediate area. Educational activities held off-refuge will not create any biological impacts on the resource.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination (check one below):*

Use is Not Compatible

X  Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* Zoning of visitor activities by time and space, clustering public use facilities, proper monitoring, educating visitors, and enforcing laws will ensure compatibility with the purposes of the refuge and mission of the National Wildlife Refuge System. Through periodic evaluation of trails and visitor contact points, the visitor services program will assess resource impacts. If future human impacts are determined through evaluation to be detrimental to

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important natural resources, actions will be taken to reduce or eliminate those impacts. Major portions of the refuge will remain undeveloped, without public interpretive facilities.

*Justification:* Interpretation and environmental education are identified in the 1997 National Wildlife Refuge System Improvement Act as activities that should be provided and expanded on refuges. Educating and informing the public through structured environmental education courses, interpretive materials, and guided tours about migratory birds, endangered species, wildlife management, and ecosystems will lead to improved support of the Service's mission to protect our natural resources.

Mandatory 15-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*All Terrain Vehicle (ATV) Use*

Recreational hunting and fishing occurs on Catahoula National Wildlife Refuge. A large portion of the refuge is inaccessible to conventional vehicles due to the lack of improved, all-weather roads. In order to disperse hunters and access remote areas for hunting and fishing, refuge users will need to utilize ATVs throughout the area. There is an extensive system of old farm roads and levees that will be used as ATV trails.

Considering the topography of the area, the need for limited use of ATVs by certain refuge users is apparent. It would be impossible to develop an effective public use program that provides optimum consumptive use opportunities without providing for all-terrain vehicle use.

Service policy pertaining to ATV use requires such use be in conjunction with wildlife-dependent activities only, and be confined to designated areas or trails identified for such use; all off-road use is restricted to foot travel only. Approximately 23 miles of ATV trails will be available seasonally for hunting and fishing access. All ATV trails are shown on refuge brochure maps and designated for public use by signs. Some modifications to this initial trail system would be necessary from time-to-time as refuge public use patterns change and/or other public use development occurs.

*Availability of Resources:* Enforcement of refuge regulations to protect trust resources and provide for a quality recreational opportunity will occur via regular patrols by refuge law enforcement officers. Currently, the complex has two dual-function officers. Additionally, personnel from the Louisiana Department of Wildlife and Fisheries will patrol the refuge and assist refuge officers when needed.

The hunt program at the refuge will cost approximately \$35,000 annually, which includes costs to create and print the hunt brochure, law enforcement support, and creating and maintaining parking areas and ATV trails. Participation in the hunt program is estimated to be 2,500 visitors annually. The refuge is not enrolled in the Fee Demonstration Program.

The fishing program at the refuge will cost approximately \$25,000 annually, which includes costs to create and print the hunt brochure, law enforcement support, and creating and maintaining parking areas and ATV trails. Participation in the fishing program is estimated to be 4,500 visitors annually. The refuge is not enrolled in the Fee Demonstration Program.

*Anticipated Biological Impacts of the Use:* All-terrain vehicle trails are located on former dirt field roads and levees that existed when the refuge was established. These trails have been crowned to provide drainage from the trail surface and are maintained by bushhogging two to three times per year. All-terrain vehicle use causes trampling of the mowed vegetation, but rutting and associated

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soil erosion is minimal. Some wildlife disturbance may occur adjacent to the trails, but is believed to be minimal and is restricted to primarily the fall and winter months. Any disturbance from ATVs is comparable to regular vehicles traveling refuge roads. All-terrain vehicles are restricted to designated marked trails.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination (check one below):*

Use is Not Compatible

Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* All-terrain vehicle use is permitted in support of hunting and fishing activities where adequate access is not available by maintained vehicular roads. The following stipulations would help ensure that the ATV use program is compatible with refuge purposes:

- All persons 16 years of age and older must have a Catahoula Refuge Hunting/Fishing permit in order to use an ATV on the refuge.
- Persons under 16 years of age are not allowed to operate an ATV on the refuge.
- All-terrain vehicle use is restricted to designated and maintained ATV trails.
- No off-trail use of ATVs is permitted.
- All-terrain vehicle tires are restricted to those no larger than 25" X 12" with a maximum lug height of 1" and a maximum allowable tire pressure of 7 psi as indicated on the tire by the manufacturer.
- All-terrain vehicles will not exceed the following specifications: weight – 750 lbs., length – 85" and width – 48".
- All weapons transported on ATVs must be fully unloaded and dismantled or encased.
- All-terrain vehicle use is permitted only during specified hours and dates.

*Justification:* Hunting and fishing are identified in the 1997 National Wildlife Refuge System Improvement Act as priority wildlife-dependent recreational activities that should be promoted and expanded on refuges. Catahoula Refuge has very limited vehicular access to most portions of the refuge. To facilitate hunting and fishing opportunities, a limited system of ATV trails is required to provide access to major portions of the refuge and to specific lakes. Without these trails the public would not be able to access major portions of the refuge.

Mandatory 10-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*Refuge Resource Research Studies*

This activity will allow university students and professors, nongovernmental researchers, and governmental scientists access to the refuge's natural environment to conduct both short-term and long-term research projects. The outcome of this research will result in better knowledge of our natural resources and improved methods to manage, monitor, and protect refuge resources. The

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refuge will support Service and U.S. Geological Survey research of neotropical migratory birds, waterfowl, woodcock, bottomland hardwood forest restoration, fisheries, amphibians and reptiles, bats, and other wildlife species. Efforts will be made to expand partnerships with Louisiana State University and other universities.

*Availability of Resources:* No additional fiscal resources are needed to conduct this use. Existing staff can administer permits and monitor use as part of routine management duties.

*Anticipated Impacts of the Use:* There should be no significant negative impacts from scientific research on the refuge. The knowledge gained from the research will provide information to improve management techniques and better meet the needs of trust resource species. Impacts, such as trampling vegetation and temporary disturbance to wildlife, will occur but should not be significant. A small number of individual plants or animals may be collected for further study. These collections will have an insignificant effect on refuge plant and animal populations.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination (check one below):*

Use is Not Compatible

X  Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* Each request for use of the refuge for research will be examined on its individual merit. Questions of who, what, when, where, and why will be asked to determine if requested research could contribute to the refuge purposes and could best be conducted on the refuge without significantly affecting the resources. If so, the researcher will be issued a special use permit. Progress will be monitored and the researcher will be required to submit annual progress reports and copies of all publications derived from the research.

*Justification:* The benefits derived from sound research provide a better understanding of species and the environmental communities present on the refuge. These benefits far outweigh any short-term disturbance or loss of individual plant and animals that might occur.

Mandatory 10-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

***Boating***

The use of non-motorized boats or motorized boats with motors of 10 horsepower or less for recreational purposes on the Catahoula Refuge Headquarters' Unit waters; boats with motors of over 10 horsepower are prohibited, whether or not the motors are used for power.

The use of non-motorized boats or motorized boats with motors of 10 horsepower or less for recreational purposes on the Catahoula Refuge Bushley Bayou Unit interior lakes; there is no horsepower limit on motors used on Bushley Creek, Big Bushley Creek, and Little Bushley Creek.

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*Availability of Resources:* No additional fiscal resources are needed to conduct this use. Existing staff can administer permits and monitor use as part of routine management duties.

*Anticipated Impacts of the Use:* All boat usage on the refuge is in conjunction with one of the following three principal recreational activities: (1) fishing (over 75 percent); (2) hunting (less than 25 percent); and (3) wildlife observation (less than 1 percent). The anticipated impacts from the use of boats in those activities are considered in the compatibility determinations for those individual recreational activities. No independent recreational boating (e.g., party boats, speed boats, and ski boats) occurs on the refuge and there are no impacts attributable to this activity.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination (check one below):*

Use is Not Compatible

X  Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* Zoning of visitor activities by time and space, clustering public use facilities, proper monitoring, educating visitors, and enforcement will ensure compatibility with the purposes of the refuge and mission of the National Wildlife Refuge System. Through periodic evaluation of boating effects on wildlife, the visitor services program will assess resource impacts. If future human impacts are determined through evaluation to be detrimental to important natural resources, actions will be taken to reduce or eliminate those impacts. Major portions of the refuge will remain without boating activity.

*Justification:* No recreational boating activities occur on the refuge separate from fishing, hunting, and wildlife observation. These activities are evaluated in separate compatibility determinations. Independent boating does not exist and, therefore, has no impact on the purpose for which the refuge was established.

Mandatory 10-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*Forest Management Program*

A forest management program will be initiated on Catahoula National Wildlife Refuge in accordance with an approved forest management plan targeted for completion in 2008. Forest management, as described in the comprehensive conservation plan, will be directed towards protecting, restoring, and managing the functions and values of the refuge forest to support viable populations of native flora and fauna consistent with sound biological principles.

The entire refuge forest habitat will be inventoried and mapped as part of the development of a forest management plan. This plan will provide a comprehensive forest management prescription to achieve forest habitat objectives over a 15-year planning cycle. Forest management prescriptions will include timber stand improvement, commercial timber harvest, and reforestation.

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Forest habitat manipulations will be carried out by commercial timber harvests. All harvesting and firewood cutting will be conducted by special use permit and carried out in accordance with the Service's Refuge Manual. The sale and disposition of forest products will be carried out by open market rules and formal bid solicitations.

*Availability of Resources:* No additional fiscal resources are needed to conduct this use. The existing staff can administer permits and monitor this use as part of routine management duties.

*Anticipated Impacts of the Use:* It is anticipated that forest habitat management will enhance the existing forest and help restore the functions and values typically associated with bottomland hardwood forests. Forest management operations will be directed at providing more vertical diversity (e.g., understory, mid-story, canopy, and super-emergent trees) within each forest block in support of the habitat requirements of forest dwelling birds, Louisiana black bears, and other resident wildlife. Reforestation will be an important component of the forest management plan with special emphasis on creating a core forest that will support area-sensitive species, such as swallow-tailed kites, cerulean warblers, and Louisiana black bears.

Forest management techniques will include the use of commercial timber harvest operations, which, if not tightly controlled and supervised, have the potential to adversely affect environmental quality. The controls placed on harvesting operations minimize possible adverse effects caused by logging equipment, such as excessive defacement and negative impacts on surface water quality. However, minimum short-term impacts do occur from harvesting operations, such as actual mechanized operation disturbance to wildlife and trampling of the understory vegetation by equipment. The understory vegetation usually recovers in one growing season and usually is more beneficial to wildlife due to increased density and palatability caused by harvest operations (i.e., decreased competition and increased sunlight reaching the forest floor).

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

*Determination (check one below):*

Use is Not Compatible

X  Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* Commercial timber harvest operations will not be carried out on Catahoula National Wildlife Refuge until a comprehensive forest inventory has been completed and a forest management plan prepared. Forest management operations will be directed at providing a desired future condition for the overall refuge forest. Individual forest stands will be inventoried, timber harvest prescriptions developed, and timber harvest operations carried out in a manner that will accomplish the refuge's forest habitat management objectives for migratory birds, threatened and endangered species, and resident wildlife. Timber harvest operations will target select trees to be sold and then removed by commercial timber and pulpwood operators. Trees may also be removed through timber stand improvement operations or by permittees when commercial sales are not feasible. Only trees needing to be removed in order to improve the forest habitat for wildlife or to restore the integrity of the forested wetlands ecosystem will be taken. Forest management operations may be conducted throughout the year, but only according to the guidelines detailed in a forest management plan.

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*Justification:* The forest management actions proposed in the comprehensive conservation plan for Catahoula Refuge are in accordance with Service guidelines for the protection, management, and enhancement of habitats for wildlife populations on the refuge. Adherence to a forest management plan promotes the enhancement of habitats for both threatened and endangered species, migratory birds and resident wildlife species; promotes habitat restoration; protects cultural resources; and provides opportunities for public recreation and environmental education.

Mandatory 10-Year Re-evaluation Date: \_\_\_\_\_

*Description of Use:*

*Trapping of Selected Furbearers and Feral Hogs*

Beaver, raccoon, and feral hogs are the species upon which management activities may be directed. All species are at a sufficiently high level on the refuge to adversely affect ecosystem functions. As indicated in the comprehensive conservation plan, beaver activities have caused significant deterioration and loss of bottomland hardwoods throughout the refuge, and excessive numbers of raccoons can have negative effects on the reproduction of forest breeding birds and wild turkeys. Not only do feral hogs compete with native wildlife for food, they are known to destroy turkey nests, kill deer fawns, and damage roads and levees. Feral hogs consume hard and soft mast, agricultural crops, and managed vegetation, such as moist-soil plant species. In addition, feral hogs may carry serious diseases, such as swine brucellosis and pseudo rabies, which are transmissible to domestic animals and humans, as well as other wildlife.

Protection and restoration of bottomland hardwoods and improvements in game and non-game populations are central components of the plan. To this end, trapping and/or hunting remain the only viable methods to reduce population levels of beaver, raccoon, and feral hogs. The Service would issue special use permits to administer a trapping program consistent with sound biology, refuge purposes, and conservation of ecosystem functions.

*Availability of Resources:* No additional fiscal resources are needed to conduct this use. The existing staff can administer permits and monitor this use as part of routine management duties.

*Anticipated Impacts of the Use:* Targeted removal of beaver, raccoon, and feral hogs from portions of the refuge would reduce the negative impacts these species are having on ecosystem functions. Control of beaver populations would help ensure the protection of important bottomland hardwood forests, including reforestation areas, and minimize beaver problems associated with the operation of more than 16 water control structures on the refuge. Regulated trapping of raccoon populations would reduce the nest predation this species causes to neotropical migratory birds and wild turkeys. Reducing feral hogs on the refuge will ensure that road and levee damage is minimized; that forest, re-forested, and managed habitats are not negatively impacted; and that native wildlife species are not adversely affected. However, no trapping program, regardless of how well it is designed, can prevent the possible take of other species. Trappers would be required to report the incidental take of other species. A negligible impact on other wildlife is expected, both short term and long term.

*Public Review and Comment:* This compatibility determination is provided for public review and comment during the Draft Comprehensive Conservation Plan and Environmental Assessment comment period.

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*Determination (check one below):*

Use is Not Compatible

Use is Compatible with the Following Stipulations

*Stipulations Necessary to Ensure Compatibility:* As a trapping program is implemented on the refuge, it would be closely monitored to assess the potential adverse effects on other wildlife, as well as the benefits to game and non-game species and their habitats. Modifications to the program would be implemented as needed to maintain compatibility. All trapping activities would be carried out under a refuge special use permit. Trappers would be limited by number, area, and season in order to target problem areas and minimize any negative impacts. Each trapper would be required to report the number and location of all traps and all wildlife taken. The implementation of a trapping program, under controlled conditions, provides an essential population control management tool and is compatible with the purposes of the refuge.

*Justification:* The purposes of Catahoula Refuge emphasize conservation of wetlands and migratory birds. Trapping is a wildlife population management tool, which is used to regulate the population of certain wildlife species when those species are disrupting ecosystem functions. Beavers, raccoons, and feral hogs have been documented to cause negative impacts to forested wetlands and nesting birds. When these negative impacts become significant on the refuge, wildlife managers utilize trapping as a management tool to control the level of damage. Certainly, beavers and raccoons are important components of the ecosystem, but when their populations and negative impacts become significant, wildlife managers need a regulated trapping program to reduce their populations to acceptable levels.

Mandatory 10-Year Re-evaluation Date: \_\_\_\_\_

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*Approval of Compatibility Determinations*

The signature of approval is for all compatibility determinations considered within the Comprehensive Conservation Plan. If one of the descriptive uses is considered for compatibility outside of the Comprehensive Conservation Plan, the approval signature becomes part of that determination.

Refuge Manager: \_\_\_\_\_  
(Signature/Date)

Regional Compatibility  
Coordinator: \_\_\_\_\_  
(Signature/Date)

Refuge Supervisor: \_\_\_\_\_  
(Signature/Date)

Regional Chief, National  
Wildlife Refuge System,  
Southeast Region: \_\_\_\_\_  
(Signature/Date)

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# Appendix VI. Intra-Service Section 7 Biological Evaluation

Originating Person: Andrew Hammond  
Telephone Number: 318-922-5261  
E-Mail: andrew\_hammond@fws.gov  
Date: June 13, 2006

Project Name: Catahoula National Wildlife Refuge Comprehensive Conservation Plan

**I. Service Program:**

- Ecological Services
- Federal Aid
- Clean Vessel Act
- Coastal Wetlands
- Endangered Species Section 6
- Partners for Fish and Wildlife
- Sport Fish Restoration
- Wildlife Restoration
- Fisheries
- Refuges/Wildlife

**II. State/Agency:** Louisiana/U.S. Fish and Wildlife Service

**III. Station Name:** Catahoula National Wildlife Refuge

**IV. Description of Proposed Action:** Implementation of the Comprehensive Conservation Plan for Catahoula National Wildlife Refuge by adopting the proposed alternative, Alternative B, which will provide guidance, management direction, operation plans, and a minor expansion of the existing refuge acquisition boundary.

**V. Pertinent Species and Habitat:**

**A. Include species/habitat occurrence map:** The refuge is outside the known breeding range of Louisiana black bear (USFWS 1995b); however, it is possible that Louisiana black bears will move through or breed on the refuge in the future.

Bald eagles are occasionally seen during winter months on the refuge. No breeding activity has been reported

**B. Complete the following table.**

SPECIES/CRITICAL HABITAT	STATUS <sup>1</sup>
Louisiana Black Bear	T
Bald Eagle	T

<sup>1</sup>STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

**VI. Location (attach map):**

**A. Ecoregion Number and Name:** 27; Lower Mississippi Valley

**B. County and State:** LaSalle and Catahoula Parishes, Louisiana

**C. Section, township, and range (or latitude and longitude):** Sec 5, 6, & 7, T8N, R6E; Sec 1, 2, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 56, T8N, R5E; Sec 36, T8N, R4E; Sec 3, 4, 5, 6, 7, 8, 9, 10, 17, 18, T7N, R5E; Sec 1, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 34, 35, 36, T7N, R4E; Sec 2, 3, 4, 7, 8, 9, 10, 17, 18, T6N, R4E.

**D. Distance (miles) and direction to nearest town:** Ten miles east of Jena, Louisiana

**E. Species/habitat occurrence:**

Louisiana Black Bear - no documentation of bears using the refuge.

Bald Eagle - occasionally observed during winter. No active nests.

**VII. Determination of Effects:**

**A. Explanation of effects of the action on species and critical habitats in item V. B (attach additional pages as needed).**

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Louisiana Black Bear	No negative impacts foreseen, more protection
Bald Eagle	No negative impacts foreseen, more protection

**B. Explanation of actions to be implemented to reduce adverse effects.**

SPECIES/ CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Louisiana Black Bear	Participate in recovery efforts by becoming an active member on Louisiana Black Bear Commission
Bald Eagle	Maintain and expand potential roosting and feeding habitat

**VIII. Effect Determination and Response Requested:**

SPECIES/ CRITICAL HABITAT	DETERMINATION <sup>1</sup>			RESPONSE <sup>1</sup> REQUESTED
	NE	NA	AA	
Louisiana Black Bear		X		Concurrence to implement the proposed Alternative B, which includes the Minor Expansion of the Current Refuge Boundary.
Bald Eagle		X		Concurrence to implement the proposed Alternative B, which includes the Minor Expansion of the Current Refuge Boundary.

<sup>1</sup>DETERMINATION/RESPONSE REQUESTED:

*NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response requested is optional but a "concurrence" is recommended for a complete administrative record.*

*NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response requested is a "concurrence."*

*AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response requested for listed species is "formal consultation." Response requested for proposed or candidate species is "conference."*

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\_\_\_\_\_  
Signature (originating station)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence \_\_\_\_\_ Nonconcurrency \_\_\_\_\_

B. Formal consultation required \_\_\_\_\_

C. Conference required \_\_\_\_\_

D. Informal conference required \_\_\_\_\_

E. Remarks (attach additional pages as needed): This concurrence of Not Likely to Adversely Affect the Louisiana Black Bear or Bald Eagle includes the Service's Louisiana Ecological Services Field Office concurrence of the effects determination for the Minor Expansion Proposal, which is part of the proposed alternative, Alternative B.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Office

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# Appendix VII. Refuge Biota

## BIRDS

*This species list is based on observations by refuge personnel and visiting ornithologists.*

**Total species:** 219

**Breeding Species:** 42

### **Symbols:**

#### **Seasonal appearance**

Sp - Spring - March to May

S - Summer - June to August

F - Fall - September to November

W - Winter - December to February

#### **Seasonal abundance**

a - abundant: a common species which is very numerous

c - common: certain to be seen in suitable habitat

u - uncommon: present but not certain to be seen

o - occasional: seen only a few times during a season

r - rare: seen at intervals of 2 to 5 years

\* - nests on the refuge

<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Waterfowl</b>				
Black-bellied Whistling-Duck	-	r	r	-
Fulvous Whistling-Duck	-	r	r	-
Greater White-Fronted Goose	r	-	o	r
Snow Goose	r	-	o	r
Canada Goose	r	-	r	r
Wood Duck*	c	c	c	c
Gadwall	c	r	c	c
American Wigeon	c	r	c	c
American Black Duck	r	-	r	r
Mallard	c	o	a	a
Mottled Duck	u	u	u	r
Blue-winged Teal	o	r	c	o
Northern Shoveler	o	r	c	c
Northern Pintail	c	r	c	c
Green-winged Teal	o	r	c	u
Canvasback	u	r	o	u
Redhead	r	-	o	r
Ring-necked Duck	c	r	c	a

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Waterfowl (Cont'd)</b>				
Greater Scaup	r	-	r	r
Lesser Scaup	u	r	u	u
Bufflehead	-	-	r	r
Common Goldeneye	-	-	r	r
Hooded Merganser	o	r	o	o
Common Merganser	o	-	-	-
Ruddy Duck	r	-	o	o
<b>Turkeys and New World Quail</b>				
Wild Turkey	r	r	r	r
Northern Bobwhite*	r	r	r	r
<b>Grebes</b>				
Least Grebe	-	-	r	r
Pied-billed Grebe*	c	u	c	c
Horned Grebe	-	-	r	r
<b>Pelicans</b>				
American White Pelican	o	r	u	u
<b>Cormorants, Anhingas</b>				
Double-crested Cormorant	c	o	u	a
Anhinga*	c	c	o	o
<b>Hérons and Bitterns</b>				
American Bittern	o	r	o	-
Least Bittern	r	o	r	-
Great Blue Heron*	c	c	c	c
Great Egret*	c	a	u	o
Snowy Egret	u	c	c	o
Little Blue Heron	u	c	c	o
Tricolored Heron	r	o	o	r
Cattle Egret	c	a	a	u
Green Heron*	u	c	c	r
Black-crowned Night-Heron	-	o	o	-
Yellow-crowned Night-Heron	-	c	u	-
<b>Ibises</b>				
White Ibis	r	u	u	r
Glossy Ibis	-	r	r	-
White-faced Ibis	-	-	o	o
Roseate Spoonbill	-	o	r	-
<b>Storks</b>				
Wood Stork	-	u	o	-

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>American Vultures</b>				
Black Vulture	u	u	u	u
Turkey Vulture	c	c	c	c
<b>Hawks and Harriers</b>				
Osprey	r	r	r	r
Mississippi Kite	o	o	-	-
Bald Eagle	o	r	o	u
Northern Harrier	u	-	u	u
Sharp-shinned Hawk	-	-	r	r
Cooper's Hawk	r	r	r	r
Red-shouldered Hawk*	c	c	c	c
Broad-winged Hawk	r	r	u	r
Red-tailed Hawk	c	u	c	c
Golden Eagle	r	-	r	r
<b>Falcons</b>				
American Kestrel	u	-	u	c
Merlin	-	-	r	r
Peregrine Falcon	-	-	r	r
<b>Rails, Gallinules, Coots</b>				
King Rail	r	r	r	r
Sora	r	-	r	r
Purple Gallinule	r	r	r	-
Common Moorhen	r	r	r	-
American Coot	c	r	u	c
<b>Plovers</b>				
Semipalmated Plover	o	r	o	-
Killdeer*	c	c	c	c
<b>Stilts and Avocets</b>				
Black-necked Stilt	o	u	o	-
American Avocet	-	-	-	r
<b>Sandpipers</b>				
Greater Yellowlegs	o	o	o	o
Lesser Yellowlegs	o	c	c	o
Solitary Sandpiper	o	o	o	-
Spotted Sandpiper	o	r	o	-
Upland Sandpiper	u	u	o	-
Sanderling	-	-	o	o
Semipalmated Sandpiper	o	-	o	-
Western Sandpiper	o	-	o	o
Least Sandpiper	u	o	u	u
Pectoral Sandpiper	o	r	o	-
Dunlin	r	-	-	r
Short-billed Dowitcher	r	-	r	o

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Sandpipers (Cont'd)</b>				
Long-billed Dowitcher	-	-	-	r
Common Snipe	c	-	c	c
American Woodcock	o	r	u	u
<b>Gulls, Terns and Allies</b>				
Bonaparte's Gull	-	-	r	r
Ring-billed Gull	o	-	o	o
Herring Gull	-	-	o	r
Gull-billed Tern	-	-	-	r
Caspian Tern	r	r	r	-
Royal tern	-	-	-	r
Forster's Tern	-	-	o	r
<b>Pigeons and Doves</b>				
Rock Dove	o	o	o	o
Mourning Dove*	c	c	a	a
Common Ground-Dove	-	-	r	r
<b>Cuckoos</b>				
Black-billed Cuckoo	r	-	r	-
Yellow-billed Cuckoo*	c	c	-	-
Greater Road Runner	r	r	-	-
<b>Owls</b>				
Barn Owl	o	o	o	o
Eastern Screech-Owl*	u	u	u	u
Great Horned Owl	u	u	u	u
Barred Owl*	c	c	c	c
<b>Nightjars and Swifts</b>				
Common Nighthawk	o	u	u	-
Chuck-will's-widow	o	o	r	-
Whip-poor-will	r	-	r	-
Chimney Swift	o	o	o	-
<b>Hummingbirds</b>				
Ruby-throated Hummingbird	o	o	o	-
<b>Kingfishers</b>				
Belted Kingfisher	c	o	u	c

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Woodpeckers</b>				
Red-headed Woodpecker	u	u	u	u
Red-bellied Woodpecker*	c	c	c	c
Yellow-bellied Sapsucker	c	-	u	c
Downy Woodpecker*	c	c	c	c
Hairy Woodpecker*	u	u	u	u
Northern Flicker*	c	u	u	a
Pileated Woodpecker*	c	c	c	c
<b>Flycatchers</b>				
Eastern Wood-Pewee	u	u	u	-
Acadian Flycatcher	c	c	u	-
Eastern Phoebe	u	o	o	c
Vermilion Flycatcher	-	-	r	o
Great Crested Flycatcher*	o	o	-	-
Eastern Kingbird	u	u	o	-
Scissor-tailed Flycatcher	-	-	r	r
<b>Shrikes</b>				
Loggerhead Shrike	u	u	u	u
<b>Vireos</b>				
White-eyed Vireo*	c	c	c	r
Yellow-throated Vireo	r	o	r	-
Red-eyed Vireo	r	u	r	-
<b>Jays and Crows</b>				
Blue Jay*	c	c	c	c
American Crow*	c	c	a	a
Fish Crow	u	u	u	u
<b>Larks</b>				
Horned Lark	o	-	r	o
<b>Swallows</b>				
Purple Martin*	c	c	u	-
Tree Swallow	c	-	c	-
Northern Rough-winged Swallow	c	c	c	r
Barn Swallow	u	o	u	-
<b>Titmice and Chickadees</b>				
Carolina Chickadee*	c	c	c	c
Tufted Titmouse*	c	u	u	c
<b>Nuthatches</b>				
Red-breasted Nuthatch -	-	-	-	r
White-breasted Nuthatch	u	-	-	u

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Creepers</b>				
Brown Creeper	u	-	u	u
<b>Wrens</b>				
Carolina Wren*	c	c	c	c
House Wren	r	-	r	o
Winter Wren	o	-	r	u
Sedge Wren	r	-	r	-
Marsh Wren	r	-	r	-
<b>Kinglets and Gnatcatchers</b>				
Golden-crowned Kinglet	c	-	o	c
Ruby-crowned Kinglet	c	-	o	c
Blue-gray Gnatcatcher	u	c	u	r
<b>Thrushes</b>				
Eastern Bluebird*	c	c	c	c
Veery	r	-	r	-
Gray-cheeked Thrush	r	-	r	-
Swainson's Thrush	r	-	r	-
Hermit Thrush	o	-	o	u
Wood Thrush*	c	c	c	-
American Robin	a	u	u	a
<b>Mockingbird and Thrashers</b>				
Gray Catbird	u	-	u	r
Northern Mockingbird*	a	a	a	a
Brown Thrasher*	c	c	c	c
<b>Starlings</b>				
European Starling	c	c	c	c
<b>Pipits</b>				
American Pipit	r	-	r	o
Sprague's Pipit	-	-	-	r
<b>Waxwings</b>				
Cedar Waxwing	o	-	o	o
<b>Wood Warblers</b>				
Golden-winged Warbler	-	-	r	-
Tennessee Warbler	r	-	r	-
Orange-crowned Warbler	r	-	r	o
Nashville Warbler	-	-	-	r
Northern Parula*	u	u	o	-
Yellow Warbler	o	-	u	-
Magnolia Warbler	o	-	-	-
Yellow-rumped Warbler	u	-	-	c
Black-throated Green Warbler	-	-	o	-

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<b>COMMON NAME</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
<b>Wood Warblers (Cont'd)</b>				
Blackburnian Warbler	o	-	-	-
Yellow-throated Warbler	u	u	u	-
Pine Warbler	-	-	o	r
Cerulean Warbler	o	r	o	-
Black-and-white Warbler	o	o	o	-
Prothonotary Warbler*	c	c	c	r
Worm-eating Warbler	r	-	r	-
Louisiana Waterthrush	-	-	-	r
Kentucky Warbler	o	o	r	-
Common Yellowthroat	u	u	o	o
Hooded Warbler	r	o	r	-
Yellow-breasted Chat*	r	o	r	-
<b>Tanagers</b>				
Summer Tanager*	c	c	u	-
Scarlet Tanager	r	-	-	-
<b>Emberizids</b>				
Eastern Towhee	u	u	u	u
Chipping Sparrow	u	u	u	u
Field Sparrow	u	u	u	u
Vesper Sparrow	r	-	r	o
Lark Sparrow	-	-	-	r
Savannah Sparrow	-	-	r	r
Henslow's Sparrow	-	-	-	r
LeConte's Sparrow	-	-	-	c
Fox Sparrow	-	-	-	r
Song Sparrow	c	-	-	-
Lincoln's Sparrow	-	-	-	r
Swamp Sparrow	r	-	r	u
White-throated Sparrow	r	-	u	c
White-crowned Sparrow	-	-	r	r
Dark-eyed Junco	-	-	u	c
<b>Cardinals and Allies</b>				
Northern Cardinal*	a	a	a	a
Blue Grosbeak	u	-	-	u
Indigo Bunting*	c	c	u	-
Painted Bunting*	c	c	u	-
Dickcissel*	o	o	-	-

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**Blackbirds**

Bobolink	-	r	-	-
Red-winged Blackbird*	c	c	c	c
Eastern Meadowlark*	c	c	c	c
Rusty Blackbird	r	-	r	o
Brewer's Blackbird	c	-	-	c
Common Grackle*	c	c	c	c
Brown-headed Cowbird*	c	c	c	c
Orchard Oriole	c	c	u	-
Baltimore Oriole	c	c	u	-

**Cardueline Finches**

Purple Finch	r	-	-	r
House Finch	-	-	-	r
American Goldfinch	u	-	-	u

**Old World Sparrows**

House Sparrow*	o	o	o	o
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(USFWS 1993)

(Harper 2004)

**Mammals\***

White-tailed Deer\*  
Fox and Gray Squirrels  
Swamp Rabbit\* Cottontail Rabbit\*  
Armadillo  
Beaver\*  
Bobcat  
Coyote  
Opossum  
Raccoon  
Nutria\*  
Muskrat  
Mink  
Opossum  
River Otter \*

(USFWS 2005)

(USFWS 1999b)

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**Fish**

Largemouth Bass\*  
Spotted Bass  
Black Crappie  
White Crappie  
Bluegill  
Redear Sunfish  
White Bass  
Channel Catfish\*  
Blue Catfish\*  
Flathead Catfish\*  
Alligator Gar  
Bowfin  
Largemouth Buffalo  
Smallmouth Buffalo  
Freshwater Drum  
Shad

(USFWS Undated)

**Possible Species List**

Amphibians**	Reptiles*-Turtles and Crocodilians	Reptiles**-Lizards and Snakes
Bronze Frog Bullfrog Eastern Narrow mouth Toad Gray Treefrog Green Treefrog Northern Cricket Frog Pig Frog Southern Leopard Frog Spring Peeper Upland Chorus Frog Eastern Newt Woodhouse's Toad	Eastern Box Turtle Red-eared slider* Eastern Mud Turtle Stinkpot Spiny Softshell Turtle	Green Anole Five-lined Skink Broad-headed Skink Ground Skink Racer Rat Snake Mud Snake Green Water Snake Yellow-bellied Water Snake Banded Water Snake Diamond-backed Water Snake Brown Snake Western Ribbon Snake Rough Earth Snake Copperhead Cottonmouth

\* *Known to occur on the refuge.*

\*\* *No amphibian or reptile surveys have been conducted on the refuge. The species listed are from surveys taken in similar habitats.*



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## *Appendix VIII. Land Protection Plan*

Acquisition boundaries are administrative lines delineating areas in which the Fish and Wildlife Service may consider negotiations with willing owners for acquisition of an interest in land. Lands within a refuge acquisition boundary do not become part of the refuge unless and until a legal interest is acquired through a management agreement, easement, lease, donation, or purchase. Lands within an acquisition boundary are not subject to any refuge regulations or jurisdiction unless and until an interest is acquired. Land interests are acquired from willing sellers/owners only. Any landowner that is within an approved acquisition boundary, even though the surrounding parcels may have been purchased by the Service, retains all the rights, privileges, and responsibilities of private land ownership. This includes, but is not limited to, the right to access, hunting, vehicle use, control of trespass; the right to sell the property to any other party; and the responsibility to pay local real estate or property taxes.

Within approved acquisition boundaries, the Service would be able to enter into negotiations for the protection of environmentally sensitive lands. The most urgent needs for acquiring an interest in these lands are as follows:

- Primary refuge access by staff and public
- Bottomland hardwood forest restoration

The proposed expansion area (Figure 1) encompasses approximately 2,824 acres and lies immediately adjacent to the Headquarters and Bushley Bayou Units of the refuge and acquisition boundary. Approval of this proposed 2,824-acre expansion would bring the total area within the approved acquisition boundary to approximately 31,078 acres.

This proposed expansion area is comprised of bottomland hardwood forests, agricultural and open fields, pastures, and minnow ponds, interspersed with residential areas. A majority of the area has been cleared.

The proposed expansion area is necessary to restore and protect critical bottomland hardwood habitats in the Mississippi Alluvial Valley. To this end, expansion of the acquisition boundary would further the refuge's mission to conserve, restore, and protect migratory birds and threatened and endangered species, especially migratory waterfowl, neotropical migratory birds, and possibly the threatened Louisiana Black Bear.

Expansion of the boundary to include the subject parcel would not only protect and conserve critical bottomland hardwood forests but would provide a valuable access to the refuge and increase the available areas for migratory bird, wading bird, and marsh bird habitats.

### **CULTURAL RESOURCES**

To date, there have been two comprehensive archaeological surveys on the refuge; however, no properties have been determined to be eligible for the National Register of Historic Places. Cultural resource surveys within the refuge have focused on the eastern shore area of Catahoula Lake (Wiseman et al., 1978; Boggess 1991; See Appendix II for references). Given the region's settlement during both the prehistoric and historic periods, the likelihood of cultural resources being present is considered relatively high (Wiseman et al., 1978; See Appendix II for references).

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Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 14 of the Archaeological Resources Protection Act require the Service to evaluate the effects of any of its actions on cultural resources (e.g., historic, architectural and archaeological) that are listed or eligible for listing in the National Register of Historic Places. In accordance with these regulations, the Service has coordinated the review of this proposal with the Louisiana State Historic Preservation Office.

The Service believes that the proposed acquisition of lands will have no adverse effect on any known or yet-to-be identified National Register of Historic Places-eligible cultural resources. However, in the future, if the Service plans or permits any actions that might affect eligible cultural resources, it will carry out appropriate site identifications, evaluations, and protection measures as specified in the regulations and in Service directives and manuals.

All tracts acquired by the Service in fee title would be removed from local real estate tax rolls because Federal Government agencies are not required to pay state or local taxes. However, the Service makes annual payments to local governments in lieu of real estate taxes, as required by the Refuge Revenue Sharing Act (Public Law 95-469). Payment for acquired land is computed on whichever of the following formulas is greatest: (1) three-fourths of 1 percent of the fair market value of the lands acquired in fee title; (2) 25 percent of the net refuge receipts collected; or (3) 75 cents per acre of the lands acquired in fee title. The estimated annual revenue-sharing payment that would be made to Catahoula or LaSalle Parishes, depending on the amount of acreage acquired in fee title, would range from \$3 to \$300.

No actions would be taken that would lead to a violation of federal, state, or local laws imposed for the protection of the environment.

## **PROPOSED ACTION**

The Service proposes to acquire, protect, and manage through fee title purchases, leases, conservation easements, and/or cooperative agreements from willing sellers. All lands and waters acquired would be managed by the Service as the Catahoula National Wildlife Refuge. The objectives of the proposed expansion would be to: (1) provide migrating and wintering habitat for migratory waterfowl consistent with the overall objectives of the Mississippi Flyway; (2) provide nesting habitat for wood ducks; (3) provide habitat and protection for threatened and endangered species; and (4) manage bottomland hardwoods and provide habitat for natural wildlife diversity.

It is anticipated that funding for this proposal would be provided through the Migratory Bird Conservation Fund and the Land and Water Conservation Fund. The authority for the use of these funds for land acquisition is the Migratory Bird Conservation Act of 1929 and the Land and Water Conservation Act; however, funding would likely come from the Migratory Bird Conservation Committee and The Conservation Fund via carbon sequestration credits placed on the agricultural portion of the property.

## **FISH AND WILDLIFE SERVICE LAND ACQUISITION POLICY**

The Service acquires lands and interests in lands, such as easements, and management rights in lands through leases or cooperative agreements, consistent with legislation or other congressional guidelines and executive orders, for the conservation of fish and wildlife and to provide wildlife-dependent public use for recreational and educational purposes. These lands include national wildlife refuges, national fish hatcheries, research stations, and other areas.

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The Service's policy is to acquire land from willing sellers, and only when other protective means, such as local zoning restrictions or regulations, are not appropriate, available, or effective. When land is needed to achieve fish and wildlife conservation objectives, the Service seeks to acquire the minimum interest necessary to reach those objectives. If fee title is required, the Service gives full consideration to extended use reservations, exchanges, or other alternatives that will lessen the impact on the owner and the community. Donations of desired lands or interests are encouraged.

The Service, like all federal agencies, has the power of eminent domain, which allows the use of condemnation to acquire lands and interest in lands for the public good. This power, however, requires congressional approval and is seldom used. The Service usually acquires lands from willing sellers. In all fee title acquisition cases, the Service is required by law to offer 100 percent of the property's appraised market value, as set out in an approved appraisal that meets professional standards and federal requirements. The acquisition methods that could be used by the Service under this alternative are described as follows:

#### 1. Leases and Cooperative Agreements

Potentially, the Service can protect and manage habitats through leases and cooperative agreements. Management control on privately owned lands could be obtained by entering into long-term renewable leases or cooperative agreements with the landowners. Short-term leases could be used to protect or manage habitat until a more secure land protection method could be negotiated.

#### 2. Conservation Easements

Conservation easements give the Service the opportunity to manage lands for their fish and wildlife habitat values. Such management precludes all other uses that are incompatible with the Service's management objectives. Only land uses that would have minimal or no conflicts with the management objectives are retained by the landowner. In effect, the landowner transfers certain development rights to the Service for management purposes as specified in the easement.

Easements would likely be useful when: (1) most, but not all, of a private landowner's uses are compatible with the Service's management objectives, and (2) the current owner desires to retain ownership of the land and continue compatible uses under the terms set by the Service in the easement. Land uses that are normally restricted under the terms of a conservation easement include:

- Development rights (e.g., agricultural and residential);
- Alteration of the area's natural topography;
- Uses adversely affecting the area's floral and faunal communities;
- Private hunting and fishing leases;
- Excessive public access and use; and
- Alteration of the natural water regime.

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### 3. Fee Title Acquisition

A fee title interest is normally acquired when (1) the area's fish and wildlife resources require permanent protection not otherwise assured; (2) land is needed for visitor use development; (3) a pending land use could adversely impact the area's resources, or (4) it is the most practical and economical way to assemble small tracts into a manageable unit.

Fee title acquisition conveys all ownership rights to the Federal Government and provides the best assurance of permanent resource protection. A fee title interest may be acquired by donation, exchange, transfer, or purchase.

The Service's proposed alternative, Alternative B, would result in the acquisition of up to 2,824 acres of wildlife habitat as an expansion of Catahoula National Wildlife Refuge. This would be accomplished through a combination of fee title purchases from willing sellers and less-than-fee interests (e.g., conservation easements and cooperative agreements) from willing sellers. The Service believes these are the minimum interests necessary to conserve and protect the fish and wildlife resources in the proposed area.

The private property has been prioritized for acquisition using the following criteria:

- Biological significance;
- Existing and potential threats;
- Significance of the area to refuge management and administration; and
- Existing commitments to purchase or protect land.

Three categories of land acquisition have been established, with the highest priority being the Priority I lands. A description of the lands within each of the three priority groups is given below. Table 1 summarizes the Service's land protection priorities and proposed methods of acquisition.

#### Priority Group I

The most important resource within this proposal is lands that provide direct access to key parts of the refuge for management purposes and public use access. These lands also provide critical areas for bottomland hardwood restoration.

#### Priority Group II

This group represents areas adjacent to Catahoula National Wildlife Refuge that provide access to very important parts of the refuge for access and management purposes. These lands also provide important areas for bottomland hardwood restoration and/or management for migratory birds, resident wildlife, and species of special concern.

#### Priority Group III

This group represents smaller parcels of land that would make the refuge more accessible to the staff and the public.

**Table 1. Protection priorities for the proposed expansion and recommended methods of acquisition**

Priority Group	No. of Landowners	Approx. Acreage	Type of Acquisition (minimum interest)
I	16	1575.0	Fee Title
II	9	864.2	Fee Title
III	2	177.4	Fee Title

**Interim Recreation Act Funding Analysis**

Refuge Name: Catahoula National Wildlife Refuge.

Date Established: 1958

Purpose(s) for which the refuge was established: The refuge was established in 1958 under the authority of the Migratory Bird Conservation Act, which calls for:

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

and the Fish and Wildlife Act of 1956, which calls for:

"... the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f (a) (4) "...the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. § 742f (b) (1) (Fish and Wildlife Act of 1956).

Recreational uses evaluated: (1) Recreational hunting of resident game and migratory birds (e.g., waterfowl, woodcock, snipe, mourning doves, and gallinules) in accordance with federal and state regulations; (2) recreational fishing of freshwater fish species (e.g., largemouth bass, bream, catfish, and crappie) in accordance with state regulations; (3) trapping of furbearing animals in accordance with state regulations; and (4) wildlife observation/photography.

Funding required to administer and to manage the recreational use: Minimal funding in the amount of \$100,000 will be made available to implement initial protection, hunting program, data collection, and non-consumptive uses.

Based on a review of the refuge budget allocated for recreational use management, I certify that funding is adequate to ensure compatibility and to administer and manage the recreational uses.

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Project Leader:  
(Signature/Date)

\_\_\_\_\_

Refuge Supervisor:  
(Signature/Date)

\_\_\_\_\_

Regional Chief, National  
Wildlife Refuge System,  
Southeast Region:  
(Signature/Date)

\_\_\_\_\_

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## *Appendix IX. List of Preparers*

Andrew Hammond, Refuge Manager, Catahoula National Wildlife Refuge  
Greg Harper, Assistant Refuge Manager, Catahoula National Wildlife Refuge  
Tina Chouinard, Natural Resource Planner, Central Louisiana National Wildlife Refuge Complex

Kathleen Schmidt, Project Manager, Mangi Environmental Group  
Julia Yuan, Environmental Analyst, Mangi Environmental Group  
Rebecca Whitney, GIS Specialist, Mangi Environmental Group  
Pam Sarlouis, Document Manager, Mangi Environmental Group  
Jill Hacker, Editor, Jill Hacker, LLC

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