I. BACKGROUND

Introduction

Contained in this Comprehensive Conservation Plan for Noxubee National Wildlife Refuge is a description of the long-term management actions and direction for the refuge. When fully implemented, this plan should achieve the refuge vision. Overriding considerations reflected in the plan are that fish and wildlife conservation requires first priority in refuge management; and that wildlife-dependent recreation is allowed and encouraged as long as it is compatible with, or does not detract from, the mission of the refuge or the purposes for which it was established.

White-tailed deer
USFWS Photo

A planning team developed a range of alternatives that could best achieve the goals of the refuge and that could be implemented. After reviewing comments and management needs the alternatives were evaluated. The alternative chosen to manage the refuge is described in Section A, Chapter IV, Management Direction. The other alternatives which were considered are addressed in Section B, Environmental Assessment.

Purpose and Need for the Plan

The purpose of the plan is to provide a 15-year management scheme that will address conservation of fish, wildlife, and plant resources and their related habitats while providing opportunities for compatible wildlife-dependent recreation uses. This document identifies the overarching wildlife, public use, and management needs of the refuge.

Specifically, the plan will:

- Provide a clear statement of management direction for the refuge;
- 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;
- Ensure that management of the refuge is consistent with federal, state, and county plans;
- Provide a basis for the development of budget requests for operational, maintenance, and capital improvement needs.

Many agencies, organizations, institutions, and businesses have developed relationships with the Service to advance the mission of national wildlife refuges. This Comprehensive Conservation Plan

supports the Partners-in-Flight Initiative; the North American Waterfowl Management Plan; the American Woodcock Management Plan; the Western Hemisphere Shorebird Reserve Network; and the National Wetlands Priority Conservation Plan. For further information regarding migratory birds, see website http://birds.fws.gov.

Fish and Wildlife Service

Mission

As part of its mission, the Service manages more than 550 national wildlife refuges covering over 92 million acres. These areas comprise the National Wildlife Refuge System, the world's largest collection of lands dedicated to wildlife, with 77 million acres in Alaska, and the remaining acreage spread across the other 49 states and several island territories.

Description

The Fish and Wildlife Service is the primary federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife populations and their habitats. Although the Service shares some conservation responsibilities with other federal, state, tribal, local, and private entities, it has specific trust responsibilities for migratory birds, threatened and endangered species, anadromous fish, and certain marine mammals. In addition, the Service administers a national network of lands and waters for the management and protection of these resources.

National Wildlife Refuge System

Mission

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."

Description

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. Activities were initiated in 1997 to complement the direction of this new legislation, including an effort to complete comprehensive conservation plans for all refuges within a 15-year time frame. These plans, which are developed with full public involvement, will assist in guiding management of refuges by establishing natural resource programs as well as recreation/education programs.

The Act states that each refuge shall be managed to:

- Fulfill the mission of the National Wildlife Refuge System;
- Fulfill the individual purpose of each refuge;
- Consider the needs of wildlife first;
- Fulfill requirements of comprehensive conservation plans that are prepared for each unit of the refuge system;

- Maintain the biological integrity, diversity, and environmental health of the refuge system; 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.

The Act also retains refuge managers' authority to use sound professional judgement in determining compatible uses on national wildlife refuges and whether or not they will be allowed. It establishes a formal process for determining "compatible use."

Wildlife viewing
USFWS Photo

Approximately 37.5 million people visited national wildlife refuges in 1998–most to observe wildlife in their natural habitats. As visitation grows on refuges, there are significant economic benefits to local communities. Economists found that refuge visitors contribute more than $400 million annually to local economies. Nearly 40 percent of the country's adults spent $101 billion on wildlife-related pursuits in 1996, according to the Fish and Wildlife Service's National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Volunteers continue to be a major contributor to the success of the refuge system. In 1998, volunteers contributed more than 1.5 million hours on refuges nationwide, a service valued at more than $20.6 million.

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

Legal Policy Context

The mission and goals of the National Wildlife Refuge System, Congressional legislation, Presidential Executive Orders, and international treaties guide administration of national wildlife refuges. Policies for management options of refuges are further refined by administrative guidelines established by the Secretary of the Interior and by policy guidelines established by the Director of the Fish and Wildlife Service. Management options of the refuge's establishing authorities, Public Law 104, Stat. 2957 (Section 108, H.R. 3338), and the National Wildlife Refuge System Improvement Act of 1997, the legal and policy guidance for the operation of national wildlife refuges, are contained in documents and acts listed in Appendix C.

Lands within the National Wildlife Refuge System are closed to public uses 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 of 1997. 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 that benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and
- Ensure that visitor activities are compatible with refuge purposes.

Relationship to State Wildlife Agency

A provision of the National Wildlife Refuge System Administration Act of 1997, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with State fish and wildlife agencies during the course of acquiring and managing refuges. State wildlife management areas and national wildlife refuges provide foundations for protection and contribute to the overall health and sustainment of fish and wildlife species in Mississippi.

The Mississippi Department of Wildlife, Fisheries, and Parks is a state-partnering agency with the Service, charged with enforcement responsibilities for migratory birds and endangered species as well as managing state natural resources. The state's participation and contribution throughout the comprehensive conservation planning process have provided for ongoing opportunities and open dialogue to improve the ecological integrity of fish and wildlife in Mississippi. An integral part of the planning process has been integrating common mission objectives, where appropriate.

The mission of the Mississippi Department of Wildlife, Fisheries, and Parks is to conserve and enhance Mississippi's natural resources, to provide continuing outdoor recreational opportunities, to maintain the ecological integrity and aesthetic quality of the resources, and to ensure socioeconomic and educational opportunities for present and future generations. For more information about the Mississippi Department of Wildlife, Fisheries, and Parks, see website **http://www.mdwfp.com.**

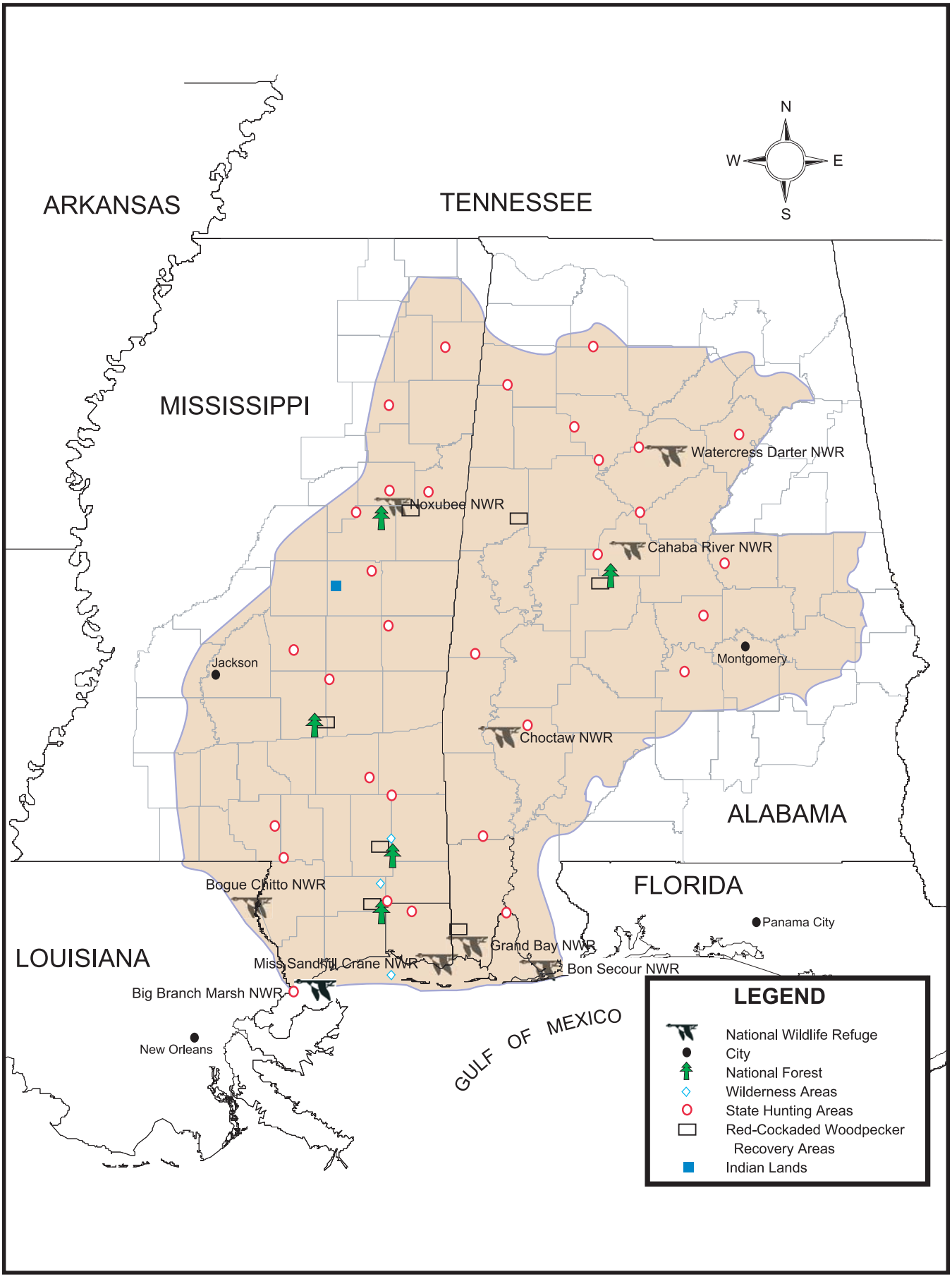
Ecosystem Context

Overview

Noxubee National Wildlife Refuge is managed within the Fish and Wildlife Service's biological watershed referred to as the Central Gulf Ecosystem (Fig. 1). This ecosystem once supported a vast collection of habitats. Dominant forces include heavy rainfall supporting abundant flood waters and frequent thunderstorms serving as an ignition source for natural fires. But, flood control, agricultural conversion, intense timber removal/alteration, past logging practices, and other human-induced alterations have affected this ecosystem, leading to significant impacts to water and soil quality, as well as plant and animal abundance and diversity.

Biological diversity, including oak/hickory/pine and bottomland hardwood forests and longleaf pine savannahs, has been severely altered from historic conditions. This has resulted in degradation of the rich composition that once supported diverse communities. Forest structure and quality are influenced by site conditions and fire, as well as past logging practices. Hardwoods are dominant over pine in many stands depending on soil moisture,

Figure 1. Fish and Wildlife Service's Central Gulf Ecosystem



past disturbance, and landowner preference. Most forests are closed-crowned, but longleaf pine savannahs also occur on dry and fire-affected sites. Historically, longleaf pine savannahs were widely dominant on the central gulf coastal plain. The elimination of longleaf pine habitats has decimated some associated wildlife species throughout the ecosystem. Species most adversely affected are area- sensitive or dependent on special habitat requirements, such as the endangered red-cockaded woodpecker which uses open pine habitat (trees 80 to 100 years old) with very open understory maintained by frequent fires.

Most privately owned lands in this ecosystem are disturbed by logging and agriculture and not managed for biological diversity. The financial and technical assistance offered through federal agencies focuses management toward promoting conservation, water quality protection, and fish and wildlife stewardship. This situation is helping the Fish and Wildlife Service to build conservation partnerships, increase species diversity, establish common conservation priorities and goals, and solve common conservation threats and problems.

Loblolly pine
USFWS Photo

Ecological Threats and Problems

National wildlife refuges in the Central Gulf Ecosystem are presented with a tremendous challenge to sustain and perpetuate biological diversity. Man's activities and the cumulative effects of human development form the basis for significant threats and problems affecting long-term biological diversity. The underlying threats and problems to biological diversity within the ecosystem include:

- Simplification and elimination of wildlife communities and habitats;
- Development and conversion of longleaf pine forests to other pine forest plantations;
- Suppression of fire and the difficulty of public acceptance to use fire as a management tool;
- Development and management of flood control/stream alterations, and water diversion projects;
- Increased demand for consumptive and non-consumptive public uses, including demand for opportunities related to fish and wildlife resources;
- Cumulative habitat effects of land and water resource development activities; and
- Loss of riverine habitats.

As a result of these conservation issues, many species that were endemic to the ecosystem have become either threatened, endangered, or rare as identified under the Endangered Species Act. Others have even become extinct. Within the ecosystem, some 76 species of plants and animals are listed as threatened or endangered, 140 species are listed as species of special concern, and 53 species, which once inhabited the ecosystem, are known to be extinct. The State of Mississippi lists 41 plant and animal species as either threatened or endangered. Conservationists are concerned with the survival of diversity in this biologically rich

region. Many species of land birds have declining populations, including the endangered red-cockaded woodpecker. Wood stork populations are declining due to man's alteration of wetlands and non-protection of nesting areas.

The land uses of the ecosystem are dominated by agriculture and managed forests. Extensive conversion of upland forests to agriculture and pine monocultures has resulted in reductions of species, species diversity, and fire frequency. Conversely, there have been increases in soil erosion, sediment loads, and introductions of exotic and invasive species. Although forest cover has continued to increase during the past 10 years, this increase largely occurs in intensively managed, often monotypic stands of pine.

Through simplification and elimination of forest habitats, including upland forests, composition has been dramatically altered in this ecosystem. The increasing demand for pulpwood and the economic incentives for shorter rotation and conversion to pine forest plantations have caused pine to become more of an economic issue. Nearly all forests are second-growth, and many sites have experienced soil erosion and loss of fertility during logging and agricultural use. Forests have been converted to farmland, industrial parks, and urban areas. Hydrological changes are caused by sedimentation, construction of dams and other barriers, and channelization. Portions of almost all the watersheds in the ecosystem have been impounded during the last 75 years.

Some logged lands have been converted to plantation forestry, a practice that results in low-diversity pine stands. Surviving old-growth forests have experienced human-caused changes, including the loss of large grazing animals (e.g., woodland bison, eastern elk), the loss of predators (e.g., red wolves, black bears, mountain lions), periods of understory livestock grazing (e.g., feral pigs), recent increases in white-tailed deer populations, invasions by non-indigenous species, and reductions in fire frequency.

Pine stands that originated through fire or farm abandonment face a constant management challenge–a native insect known as the southern pine beetle. Outbreaks of this insect are more common in older and stressed trees. Human activities may have resulted in larger blocks of pine forests of relatively uniform age becoming more susceptible to large outbreaks of this beetle. Although these outbreaks can be alarming and can render trees hazardous to human life and property, the southern pine beetle may play a role in natural fire regimes by helping produce heavy fuel loads (White 1987). In addition, human-induced fire has played a key role in shaping this ecosystem over the past 7,000 years. However, managing prescribed burns to improve wildlife habitat is problematic due to the lack of public acceptance of the procedure, and the difficulty in acquiring the necessary permits to burn.

In general, the surviving old-growth forests represent a biased sample of the original forests; they tend to be on steeper, drier, rockier, or wetter sites that were harder to farm or less valuable for harvest

(White and White 1995). The mid- to late-1900s represented a period of reduced fire frequency, size, and intensity. This, in turn, led to increases in species adapted to moister conditions, understory stem density and woody cover, and decreases in fire-dependent species.

Exotics can be very invasive and detrimental to indigenous species of the ecosystem. Exotic species such as kudzu, bicolor lespedeza, water hyacinth, and feral hogs are posing major problems to declining wildlife populations. Action must be taken annually to control these populations.

Throughout the southeast, natural flooding and erosion dynamics of rivers are important natural processes to maintain biological diversity. Impoundments, changes in the quality and quantity of water, draining of bottomlands, and channelizing of rivers are major causes of loss in biological diversity dependent on dynamic stream and river systems.

Modifications to the historic flood plains have caused major declines in fishery and aquatic resource productivity. The reduction of ecological functions from non-point source runoff of sediments, excess nutrients, and pesticides is a continual problem. Paddlefish and mussel populations are declining due to the chain of water management modification and management along the Tennessee-Tombigbee River Watershed. Alteration of the hydrological regime is a common disturbance in bottomland and floodplain forests, rivers, streams, and lakes. Hydrological change has altered flood depth, duration, frequency, and seasonal timing in many of these systems leading to a change in the water table in specific cases.

Channel modifications, which include straightening the streambed, smoothing bottom contours, and removing logs, obstructions, and plants, alter the rate and timing of water flow (the local water table is lowered, resulting in increased downstream flooding, decreased aquatic productivity, micro-habitats within the channel, and disrupted food webs). Sedimentation, blockages, and channel modifications often occur within one river system, leading to decreases in native fishes and other aquatic species, a loss of species intolerant of such changes, and increases in tolerant species and non-indigenous species (Crumby et al., 1990). Non-point source pollution and sedimentation are hard to control. Sedimentation is a serious problem for most aquatic organisms, particularly primary producers as well as benthic (bottom-dwelling) invertebrates and fishes that require gravel or rock substrates.

Other factors responsible for depletion of aquatic faunas are pollution (including chemical and thermal pollution) and introduction of non-native fish and aquatic plants. Invasive, non-native plants that are capable of altering function (i.e., hydrology, photosynthesis, food webs), in aquatic systems in the ecosystem include hydrilla and water hyacinth (Hotchkiss 1967; Lachner et al., 1970), which can form homogenous stands and exclude more desirable native species. Remaining waters are influenced by levee construction, channel modification, agricultural runoff, cattle grazing, timber harvest, and invasion of non-native species.

The demand for public recreation and environmental education in the ecosystem, as well as throughout the refuge system, is constantly increasing. As the population increases, it brings about a corresponding increase in urban and industrial development. The result is a continuous decrease in the amount of rural land where people typically carry out wildlife-dependent activities such as hunting, fishing, bird-watching, etc. As these changes occur, the public demand for these activities falls increasingly on public land, both state and federal.

Conservation Priorities

Conservation priorities for national wildlife refuges in the Central Gulf Ecosystem focus on threatened and endangered species, trust species, and species of area concern. By working with others, the Service is more effective in achieving its overall mission and management goals. A combination of land protection and habitat management methods is utilized by the Service and others to compensate for old growth pine and floodplain woods habitat loss and to meet shared/common long-term goals established for this area.

Sustainable communities and species conservation and recovery on refuges require the joint efforts of private landowners, local communities, and state and federal governments. The Fish and Wildlife Service is adopting collaborative resource partnerships both within and outside of national wildlife refuges to reduce the declining trend of fish and wildlife populations and biological diversity; to establish conservation priorities; to clarify goals; and to solve common threats and problems associated with fish and wildlife resources. Biological objectives in the ecosystem for species targeted in this plan reflect the Partners-in-Flight Plan, North American Waterfowl Management Plan, and the recovery of the red-cockaded woodpecker.

Biological objectives for refuges are derived from recommendations of the ecosystem planning team as well as from conservation initiatives of other agencies–both governmental and non-governmental. These conservation initiatives are jointly managed by government agencies, conservation organizations, and private landowners. The ecosystem team has identified the following four priority tasks, each of which the refuge will work to support. These tasks are reflected in the goals presented in Chapter IV.

- Manage populations of migratory birds, including restoring and protecting key habitats;
- Restore and protect important pine habitats and their associated plant and animal communities;
- Restore and protect the important functions and values of riverine habitats; and
- Undertake activities to increase public awareness and interest in fish and wildlife, their habitats, and the ecosystems upon which they depend.

Section A.
Final Comprehensive Conservation Plan

CHAPTER I - Background