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# Bond Swamp National Wildlife Refuge

## Comprehensive Conservation Plan



U.S. Department of the Interior  
Fish and Wildlife Service  
Southeast Region

September 2009

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**COMPREHENSIVE CONSERVATION PLAN**

**BOND SWAMP NATIONAL WILDLIFE REFUGE**

*Bibb and Twiggs Counties, Georgia*

**U.S. Department of the Interior**  
**Fish and Wildlife Service**  
*Southeast Region*  
**Atlanta, Georgia**

**September 2009**

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## *Executive Summary*

The Fish and Wildlife Service (Service) has prepared this Comprehensive Conservation Plan (CCP) to guide the management of Bond Swamp National Wildlife Refuge (NWR) in Bibb and Twiggs Counties, Georgia. This CCP outlines programs and corresponding resource needs for the next 15 years, as mandated by the National Wildlife Refuge System Improvement Act of 1997.

Before the Service began planning, it conducted a biological review of the refuge's wildlife and habitat management program and conducted public scoping meetings to solicit public opinion of the issues the CCP should address. The biological review team was composed of biologists from federal and state agencies and non-governmental organizations that have an interest in the refuge. The refuge staff held one public scoping meeting and a 30-day public scoping comment period. Also, a 30-day public review and comment period of the draft comprehensive conservation plan and environmental assessment was provided.

The Service developed and analyzed three alternatives. Alternative A was a proposal to maintain the status quo. There would be no change to refuge management. The refuge would continue to provide a minimum of 4,000 acres of winter flooded bottomland forest habitat for wintering waterfowl. There would be no active effort to inventory or census wintering waterfowl populations. Wood ducks would not be banded. Wetlands would not be managed for waterfowl habitat enhancement. There would be no management of forest-dependent landbirds. Active colonial nesting waterbird rookeries would continue to be protected from human disturbance. No active management of amphibians and reptiles would occur. Black bear surveys would not be conducted. Bat surveys would not be conducted. With regard to managing species of concern, the refuge would continue to provide a buffer zone around the existing bald eagle nest on Stone Creek. With regard to controlling invasive animals, there would be continued limited feral hog hunting with a harvest of 50-200 hogs per year.

There would be no active forest management. The refuge would continue implementing the current fire management plan that calls for suppression as the only appropriate management response. There would be no active management of open water or wetlands. Invasive plant species would not be actively controlled. No active management of roadsides and rights-of-way by refuge (power companies maintain rights-of-way) would occur.

The focus of Alternative B would be custodial management in which refuge staff would cease all active management of both upland and wetland habitat at Bond Swamp NWR, employing "passive management" instead. Management of fish and wildlife populations under Alternative B would be identical to Alternative A.

Habitat management under Alternative B would be identical to Alternative A. The refuge would continue implementing the current fire management plan, which calls for suppression as the only appropriate management response. There would be no active management of open water or wetlands. Invasive plant species would not be actively controlled. No active management of clearings and rights-of-way would occur.

The Service selected Alternative C as its preferred alternative and is reflected in this CCP. Under Alternative C Bond Swamp NWR would expand wildlife and habitat management efforts as well as visitor services and public use opportunities. Alternative C is considered the most effective management approach for pursuing the purposes of Bond Swamp NWR. These purposes are to ensure that Bond Swamp NWR conserves and manages the forested wetlands in the Ocmulgee River

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floodplain, associated uplands, and the wildlife that depend on these habitats; to protect and manage threatened and endangered species, migratory birds, and species of concern; to conserve and manage the diversity, abundance, and ecological role of native fish and wildlife species; to restore and maintain bottomland forests, upland forests, and wetland habitats; to protect cultural resources; and to provide and enhance opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, and other compatible public uses.

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# *I. Background*

## **INTRODUCTION**

This Comprehensive Conservation Plan (CCP) for Bond Swamp National Wildlife Refuge (NWR) was prepared to guide future management actions and direction for the refuge. It is important to note throughout this document that as an overriding principle, 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. The draft of this plan was made available to state and federal government agencies, conservation partners, and the general public for review and comment. The comments from each entity were considered in the development of this CCP, describing the Fish and Wildlife Service's preferred plan.

## **PURPOSE AND NEED FOR THE PLAN**

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

Specifically, the CCP is needed to:

- Provide a clear statement of refuge management direction;
- Provide refuge neighbors, visitors, and government officials with an understanding of Fish and Wildlife 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 Refuge System; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

## **FISH AND WILDLIFE SERVICE**

The Fish and Wildlife Service (Service) traces its roots to 1871 and the establishment of the Commission of Fisheries involved with research and fish culture. The once independent commission was renamed the Bureau of Fisheries and placed under the Department of Commerce and Labor in 1903.

The Service also traces its roots to 1886 and the establishment of a Division of Economic Ornithology and Mammalogy in the Department of Agriculture. Research on the relationship of birds and animals to agriculture shifted to delineation of the range of plants and animals so the name was changed to the Division of the Biological Survey in 1896.

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The Department of Commerce, Bureau of Fisheries, was combined with the Department of Agriculture, Bureau of Biological Survey, on June 30, 1940, and transferred to the Department of the Interior as the Fish and Wildlife Service. The name was changed to the Bureau of Sport Fisheries and Wildlife in 1956, and finally to the Fish and Wildlife Service in 1974.

The Service, working with others, is responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people through federal programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries.

As part of its mission, the Service manages more than 540 national wildlife refuges, covering over 95 million acres. These areas comprise the 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 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 (Improvement Act) established, for the first time, a clear legislative mission of wildlife conservation for the 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 the Improvement Act, approved plans will serve as the guidelines for refuge management for the next 15 years. The Improvement Act states that each refuge shall be managed to:

- Fulfill the mission of the 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

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- 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.

The following are just a few examples of your national network of conservation lands. Pelican Island National Wildlife Refuge, the first refuge, was established in 1903 for the protection of colonial nesting birds in Florida, such as the snowy egret and the brown pelican. Western refuges were established for American bison (1906), elk (1912), prong-horned antelope (1931), and desert bighorn sheep (1936) after over-hunting, competition with cattle, and natural disasters decimated once-abundant herds. The drought conditions of the 1930s Dust Bowl era severely depleted breeding populations of ducks and geese. Refuges established during the Great Depression focused on waterfowl production areas (i.e., protection of prairie wetlands in America's heartland). The emphasis on waterfowl continues today but also includes protection of wintering habitat in response to a dramatic loss of bottomland hardwoods. By 1973, the Service had begun to focus on establishing refuges for endangered species.

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 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), the same refuges identified for the 1995 study. 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 dollar spent on the Refuge System, surrounding communities benefited with \$4.43 in recreation expenditures and \$1.42 in job-related income (Caudill and Laughland, unpubl. data).

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 come 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.

The Improvement Act stipulates that comprehensive conservation plans be prepared in consultation with adjoining federal, state, and private landowners and that the Service develop and implement a process to ensure an opportunity for active public involvement in the preparation and revision (every 15 years) of the plans.

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All lands of the Refuge System will be managed in accordance with an approved comprehensive conservation plan that will guide management decisions and set forth strategies for achieving refuge unit purposes. The plan will be consistent with sound resource management principles, practices, and legal mandates, including Service compatibility standards and other Service policies, guidelines, and planning documents.

## **LEGAL AND POLICY CONTEXT**

### **Legal Mandates, Administrative and Policy Guidelines, and Other Special Considerations**

Administration of national wildlife refuges is guided by the mission and goals of the 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. Select legal summaries of treaties and laws relevant to administration of the Refuge System and management of the Bond Swamp NWR are provided in Appendix C.

Treaties, laws, administrative guidelines, and policy guidelines assist the refuge manager in making decisions pertaining to soil, water, air, flora, fauna, and other natural resources; historical and cultural resources; research and recreation on refuge lands; and provide a framework for cooperation between Bond Swamp NWR and other partners, such as the Georgia Department of Natural Resources' Wildlife Resources Division and private landowners.

Lands within the Refuge System are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. All programs and uses must be evaluated based on mandates set forth in the 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; and
- Ensure that visitor activities are compatible with refuge purposes.

The Improvement Act further identifies six priority wildlife-dependent recreational uses. These uses are: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. As priority public uses of the Refuge System, they receive consideration over other public uses in planning and management.

### **Biological Integrity, Diversity, and Environmental Health Policy**

The Improvement Act directs the Service to ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans. The policy is an additional directive for refuge managers to follow while achieving refuge purpose(s) and the Refuge System mission. It provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. When evaluating the appropriate management direction for refuges, refuge

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managers will use sound professional judgment to determine their refuges' contribution to biological integrity, diversity, and environmental health at multiple landscape scales. Sound professional judgment incorporates field experience, knowledge of refuge resources, refuge role within an ecosystem, applicable laws, and best available science, including consultation with others both inside and outside the Service.

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

Multiple partnerships have been developed among government and private entities to address the environmental problems affecting 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 CCP.

This CCP supports, among others, the North American Bird Conservation Initiative, the North American Waterfowl Management Plan, the Partners-in-Flight Bird Conservation Plan, the U.S. Shorebird Conservation Plan, the Northern American Waterbird Conservation Plan, the National Wetlands Priority Conservation Plan, the Waterbird Conservation for the Americas partnership, and the Atlantic Coast Joint Venture.

**North American Bird Conservation Initiative.** Started in 1999, the North American Bird Conservation Initiative is a coalition of government agencies, private organizations, academic institutions, and private industry leaders in the United States, Canada, and Mexico, working to ensure the long-term health of North America's native bird populations by fostering an integrated approach to bird conservation to benefit all birds in all habitats. The four international and national bird initiatives include the North American Waterfowl Management Plan, Partners-in-Flight, Waterbird Conservation for the Americas, and the U.S. Shorebird Conservation Plan.

**North American Waterfowl Management Plan.** The North American Waterfowl Management Plan is an international action plan to conserve migratory birds throughout the continent. The plan's 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. Plan projects are international in scope, but implemented at regional levels. These projects contribute to the protection of habitat and wildlife species across the North American landscape. Potential roles of Bond Swamp NWR in support of this initiative are:

- Develop waterfowl winter population and/or foraging habitat objectives in support of Atlantic Coast Joint Venture goals.
- Provide foraging habitat for wintering waterfowl through protection of "natural" flooding regimes.
- Where practical and compatible with other objectives, promote development of more permanently flooded areas (e.g., sloughs, beaver ponds)
- Promote development of oaks and other small mast producing species
- Promote breeding and brood rearing habitat for wood ducks.

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- Provide spatial/temporal sanctuary to waterfowl.
  - Consider future public use opportunities tied to waterfowl.

**Partners-in-Flight Bird Conservation Plan.** Managed as part of the Partners-in-Flight Plan, the Southern Piedmont and South Atlantic Coastal Plain physiographic area represents a scientifically based land bird conservation planning effort that ensures long-term maintenance of healthy populations of native land birds, primarily non-game land birds. Non-game land birds have been vastly under-represented in conservation efforts, and many are exhibiting significant declines. This plan is voluntary and non-regulatory, and focuses on relatively common species in areas where conservation actions can be most effective, rather than the frequent local emphasis on rare and peripheral populations. Potential roles of Bond Swamp NWR in support of this initiative are:

- Provide, manage, and restore where possible bottomland forest, forested wetland, and oak-pine upland habitats in support of breeding and wintering priority landbirds identified by Partners-in-Flight.
- Improve vegetative structural complexity in bottomland areas that are otherwise uniform and lacking in strata development.
- Opportunistically encourage soft mast producing trees and shrubs on upland and bottomland habitats.

**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 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. Potential roles of Bond Swamp NWR in support of this initiative are:

- Protect colonial waterbird rookeries.
- Give special consideration to protection and/or management of more permanently flooded areas as waterbird foraging habitat.

**National Wetlands Priority Conservation Plan.** The National Wetlands Priority Conservation Plan mandates that the Secretary of the Interior establish, and periodically review and revise, a national wetlands priority conservation plan which shall specify, on a region-by-region basis or other basis considered appropriate by the Secretary, the types of wetlands and interests in wetlands which should be given priority with respect to federal and state acquisition.



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**Waterbird Conservation for the Americas.** Waterbird Conservation for the Americas (*Conservación de las Aves Acuáticas de las Américas*) is an independent partnership of individuals and institutions having interest and responsibility for conservation of waterbirds and their habitats in the Americas. The partnership was created to support a vision in which the distribution, diversity, and abundance of populations and habitats of breeding, migratory, and non-breeding waterbirds are sustained or restored throughout the lands and waters of North America, Central America, and the Caribbean. In 2004, Waterbird Conservation for the Americas initiated a project to gather and assess information in order to strategically advance conservation for critically threatened waterbird species and sites in Central America, the Caribbean, and South America. This information will be used to raise awareness among decision-makers and representatives from key governments and non-governmental organizations of the increasing threats to waterbirds and their habitats, and to inform future monitoring and management of these resources throughout the entire Western Hemisphere.

**Atlantic Coast Joint Venture.** Joint ventures are the best forum for engaging in collaborative efforts to help define one's conservation objectives in the context of landscape, ecosystem, or population sustainability. Working both collectively and independently, joint venture partners conduct activities in support of population and habitat objectives developed cooperatively through an interactive process of biological planning and conservation design. The Atlantic Coast Joint Venture (ACJV) is the relevant joint venture for the piedmont and coastal plain of Georgia, including Bond Swamp NWR. Much of the regional priorities and objectives of the ACJV are based on information developed by international, national, and regional bird initiatives (e.g., Partners-in-Flight, North American Waterbird Conservation Plan). These initiatives have identified the highest priority species, outlined limiting factors and threats to their conservation, and articulated population goals of varying specificity. In doing so, they provided a compelling justification for the ecoregion-based joint ventures to begin developing and pursuing corresponding habitat conservation goals. The structure, composition, and landscape context intrinsic to these habitat goals has received much attention by joint ventures. Although the ACJV is still early in the process of deriving habitat goals to support bird population objectives, this and similar efforts by joint venture partners establish a perspective for considering desired future conditions and the conservation role of Bond Swamp NWR.

## **RELATIONSHIP TO STATE WILDLIFE AGENCY**

A provision of the Improvement Act, 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 national 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 Georgia.

The Georgia Department of Natural Resources, Wildlife Resources Division (WRD), provides management and protection for the state's fish and wildlife resources through conservation enforcement officers in each county statewide and through fisheries and wildlife biologists. The WRD's major goal is to promote stewardship and enjoyment of Georgia's natural resources, both for present and future generations. It is responsible for freshwater fish, wildlife, marine resources, waterway safety, state lands, state parks, and other natural resources. The WRD manages 94 wildlife management areas on approximately 1 million acres, public fishing areas, and natural areas. The Georgia State Parks and Historic Sites is charged with managing state park lands and historic sites. It manages 48 state parks and 15 historic parks on over 800,000 acres of land. Additionally, the state agencies provide and direct public recreation opportunities, including extensive hunting and fishing programs on wildlife management areas and parks.

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

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## *II. Refuge Overview*

### **INTRODUCTION**

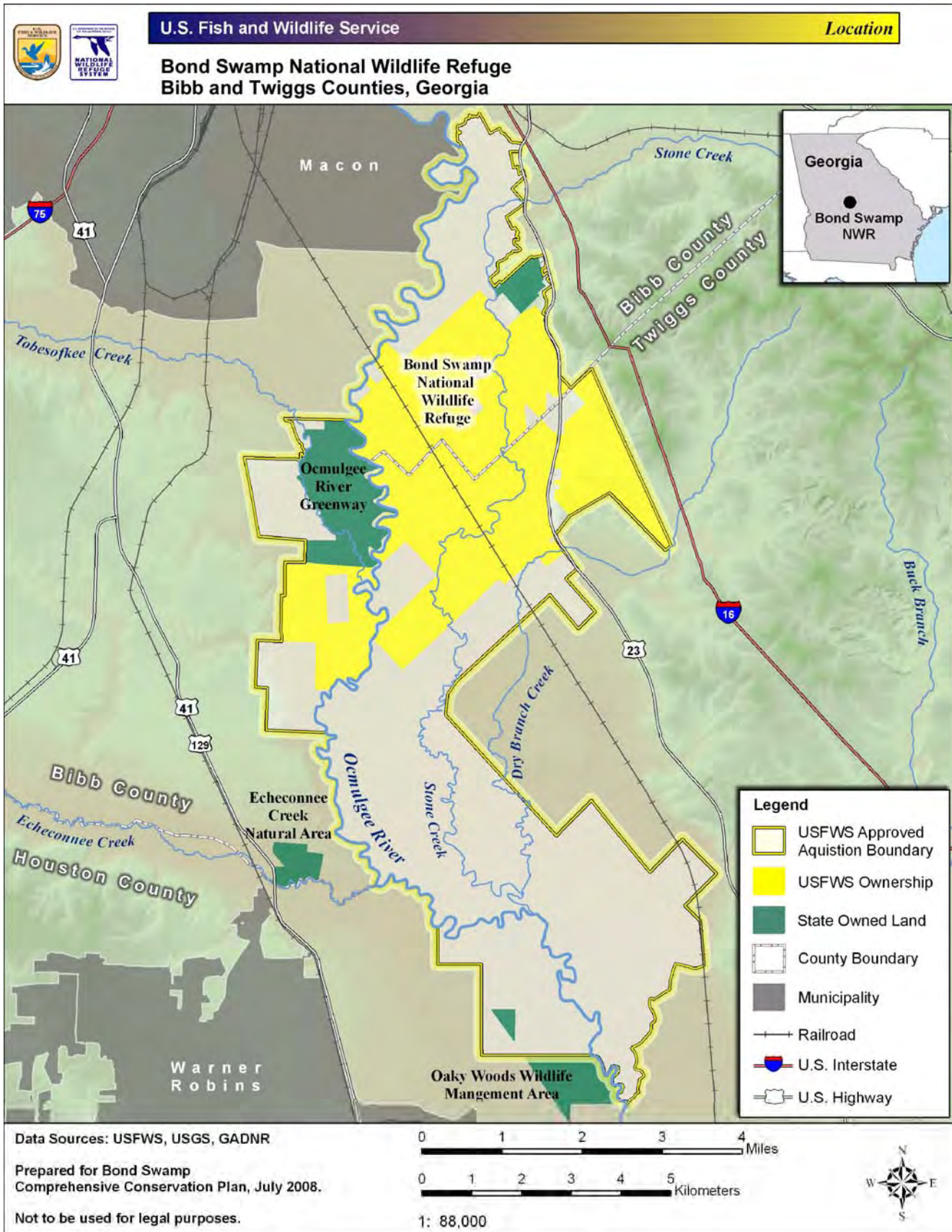
Bond Swamp NWR is located along the Ocmulgee River in Bibb and Twiggs Counties, Georgia, approximately 6 miles south of the city of Macon (Figure 1). The refuge was established on October 16, 1989, to protect, maintain, and enhance the ecosystem of the Ocmulgee River floodplain (USFWS 1989). The refuge is situated along the fall line separating the physiographic regions of the Piedmont from the Coastal Plains and contains primarily wetlands associated with the Ocmulgee River floodplain. A strip of uplands and two large limestone bluffs border the wetlands. The refuge did not open for public use until 1999.

The refuge has a diversity of vegetation communities, including upland mixed hardwood-pine, bottomland hardwoods, tupelo gum swamp forests, creeks, tributaries, beaver swamps, and oxbow lakes. The refuge is rich in wildlife diversity, including white-tailed deer, wood ducks, black bears, alligators, wild turkey, a nesting pair of bald eagles, and excellent wintering habitat for waterfowl. Extensive bottomland hardwoods provide critical habitat for neotropical songbirds of concern, such as Swainson's warbler, wood thrush, prothonotary warbler, and yellow-billed cuckoo. The combination of warm weather and wet areas at Bond Swamp NWR also provide ideal conditions for a variety of reptile and amphibian species.

The original land was purchased through cooperative efforts of the Service and the Nature Conservancy. Currently, Bond Swamp NWR consists of approximately 7,348 acres. Most of the refuge is owned in fee title by the Service, except for 1,072 acres that are managed by the Service through a lease agreement with the State of Georgia. Within this agreement, the Service manages Brown's Mount, a historic/cultural site that encompasses 165 acres of upland forest. In total, this acreage is essentially contiguous, though it straddles the Ocmulgee River and major tributaries, and is punctuated by a handful of noteworthy in-holdings. An expansion proposal in 1999 established the present acquisition boundary, extending from the current refuge boundaries to the north, west, and especially south. The approved acquisition area also includes portions of Bibb and Twiggs Counties, Georgia, and encompasses approximately 18,000 acres of bottomland and adjacent upland habitats along the Ocmulgee River representative of those already managed (USFWS 1999) (Figure 1).

In 1999, Bond Swamp NWR became an official partner in the Ocmulgee Heritage Greenway project, a cooperative effort to protect the wetland systems of the Ocmulgee River through development of an integrated system of natural, scenic, and historical sites affording diverse public education and recreational opportunities. In demonstration of its commitment to this project, Bond Swamp NWR entered into a Memorandum of Understanding with other private and public Greenway partners, including the Trust for Public Land, National Park Service, city of Macon, Georgia Department of Natural Resources, Macon Water Authority, and Bibb County Board of Commissioners. Part of the Greenway project is an extensive wetland conservation area that seeks to conserve the hydrology and natural resources of the area. The forested wetlands and adjacent uplands of Bond Swamp NWR figure prominently in these plans, and toward this end, several hundred acres have been acquired by the refuge since partnering in the Greenway project. The Trust for Public Land assisted the refuge in this second acquisition phase. The refuge has also expanded public use and access to its lands as a result of the Greenway project, and has plans for continuing to provide increased public recreational opportunities.

Figure 1. Bond Swamp NWR and vicinity



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## REFUGE HISTORY AND PURPOSE

The Ocmulgee River and its forests have been an important part of Macon's history and development. This region was important to Native Americans from Ice Age hunters to the Muscogee (Creeks) and Seminoles of historic times. Native Americans relied on the river and its surrounding forests for food, water, shelter, and transportation for thousands of years before European settlers arrived in the area. When early European explorers and frontiersmen arrived, they traveled and traded along the river, and hunted and trapped in the forests along its banks. As European settlements in the area expanded, the forests were logged. Mills operating along the river relied on it for both power and product transportation.

In recent years, the Macon area has experienced rapid development through residential and commercial expansion. To protect and manage the river corridor, concerned citizens, along with local, state, and federal government agencies, initiated the Ocmulgee Heritage Greenway effort. Bond Swamp NWR is an important link in the Ocmulgee Heritage Greenway, which is working to protect the Ocmulgee River and its rich resources. The Greenway creates an integrated system of scenic, historic, and recreational resources along the Ocmulgee River for the public's enjoyment. Bond Swamp NWR fills a vital role along the Greenway by providing a place for the conservation and management of the fish, wildlife, and plants of the Ocmulgee River ecosystem.

The Improvement Act states that each refuge is to be managed to both fulfill the purposes for which it was established and the mission of the Refuge System. If there is a conflict between the two, the purposes for which the refuge was established takes precedence.

The refuge was established in 1989 under the authority of the Fish and Wildlife Act of 1956 [16 U.S.C. 742(a)], as amended, and the Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901(b)]. These acts established the overarching purpose of Bond Swamp NWR by providing for the acquisition of land by the Service for the development, advancement, management, conservation, and protection of fish and wildlife resources; the conservation of wetlands to maintain public benefits; and the conservation of wetlands to help fulfill international obligations of various migratory bird treaties and conventions.

The objectives for which the area is managed are:

- To conserve and protect a diverse, threatened wetland ecosystem and its associated values.
- To conserve, protect, reestablish, and manage for threatened and endangered species of wildlife.
- To manage for migratory birds, with emphasis on providing optimum habitat for wintering waterfowl and enhancing nesting and brood habitat for wood ducks.
- To manage for native wildlife species and their associated habitats.
- To provide opportunities for compatible public educational, interpretational, and recreational opportunities associated with wildlife and their habitats.

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Bond Swamp NWR fills a vital role along the Ocmulgee Heritage Greenway, which is working to protect the Ocmulgee River and its resources. The refuge provides a place for the conservation of the fish, wildlife, and plants of the Ocmulgee River ecosystem. The refuge is significant because:

- As many as 200 bird species occur on the refuge. This includes waterfowl, waterbirds, shorebirds, and neotropical migratory birds.
- The area provides ideal nesting habitat for the Swainson's warbler, listed as a species of concern by Partners-in-Flight.
- Several rare species of butterflies associated with the river cane habitat can be found on the refuge.
- There is an active bald eagle nest on Bond Swamp NWR.
- Bond Swamp NWR supports one of the three black bear populations in Georgia.
- Bond Swamp NWR and the surrounding area is one of the largest areas of intact forested wetlands remaining in Georgia.

Refuge management tools used include:

- Partnerships: active member of the Ocmulgee Heritage Greenway.
- Education/interpretation.
- Deer herd management and feral hog population control with public hunting.
- Law enforcement.

In sum, the refuge was established to protect a biologically diverse system of wetland and upland habitats for the benefit of numerous plants and animals on the Ocmulgee River floodplain. The refuge is managed to provide public access to traditional, wildlife-dependent outdoor recreational activities.

## **SPECIAL DESIGNATIONS**

Bond Swamp NWR does not contain any lands under special designation by the Federal Government, such as congressionally designated wilderness areas, oil and gas activities, federally designated wild and scenic rivers, demonstration areas, or research natural areas. However, Bond Swamp NWR is part of the Ocmulgee Heritage Greenway and provides most of the conservation area for this program by protecting the important wetland forests and associated wildlife. Additionally, the concept of an Ocmulgee River National Heritage Corridor was proposed in 2004 as part of a feasibility study (Mastran et al. 2004). The purpose of seeking National Heritage Corridor designation is to increase understanding and raise awareness of the Ocmulgee River and the adjacent cultural and natural resources. It is an effort to rediscover and reconnect people with the river after decades of neglect. The designation could include the stretch of the Ocmulgee River within the refuge.

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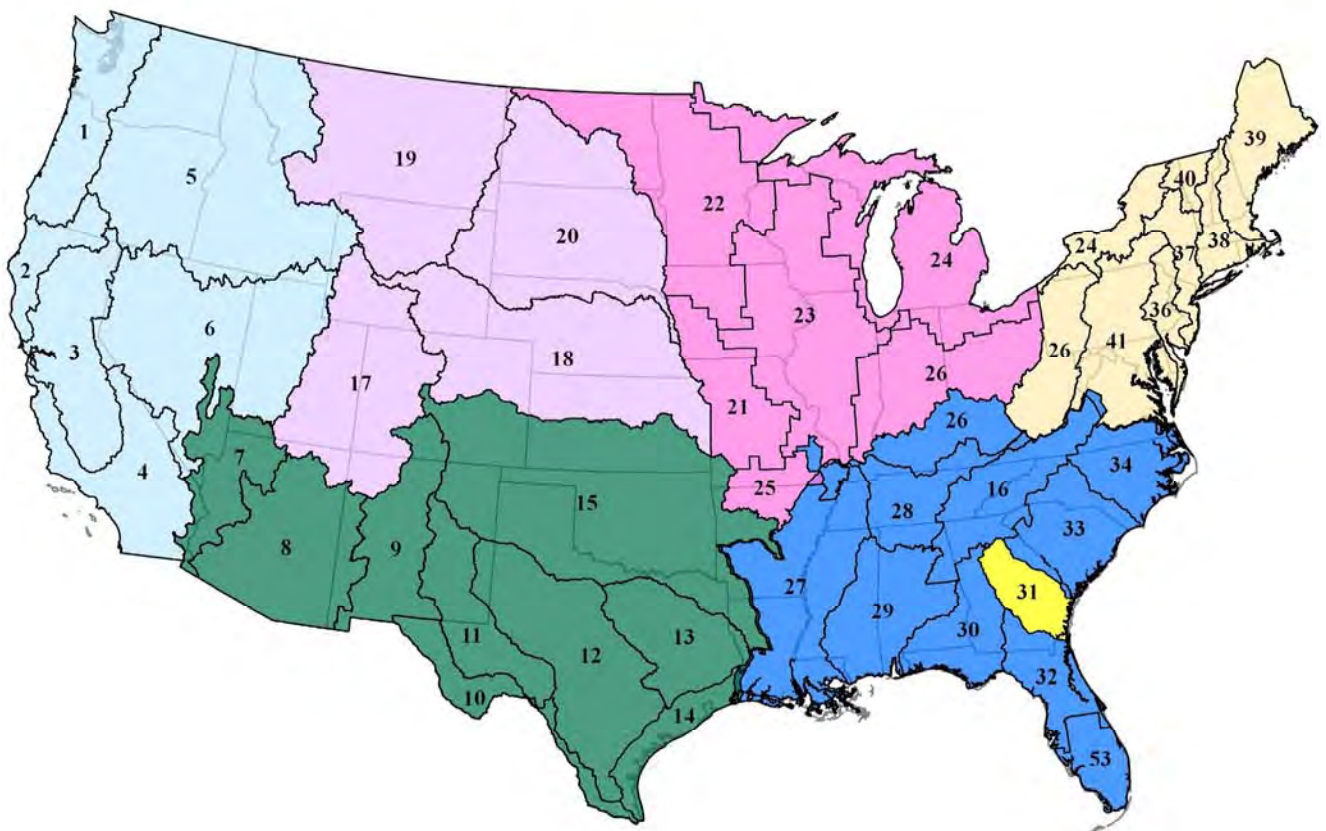
## ECOSYSTEM CONTEXT

In approaching its mission to conserve wildlife and their habitats throughout the country, the Service has found it useful to divide the entire United States into 53 distinct ecosystems, drawn primarily along watershed boundaries (Figure 2). Bond Swamp NWR lies within the Altamaha Watershed Ecosystem in Georgia (USFWS, no date-a).

An ecosystem is a geographic area including all the living organisms (e.g., people, plants, animals, and microorganisms), their physical surroundings (e.g., soil, water, and air), and the natural cycles that sustain them. All of these elements are interconnected. Managing any one resource affects the others in that ecosystem. Ecosystems can be small (a single stand of aspen) or large (an entire watershed including hundreds of forest stands across many different ownerships).

The Service has adopted an ecosystem approach to conservation because it cannot just look at a single animal, species, or piece of land in isolation from all that is around it. Conservation will not be achieved within the boundaries of a national wildlife refuge, aquatic resources will not be restored within a national fish hatchery, and listing an endangered species is not going to conserve the system. All of these are interconnected. If one is disturbed or managed, all of the others will be affected.

**Figure 2. Service designated ecosystems in the conterminous United States** (Note: the Altamaha Watershed ecosystem is #31.)



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The ecosystem approach is comprehensive. It is based on all of the biological resources within a watershed and it considers the economic health of communities within that watershed. A watershed is the total land area from which water drains into a single stream, lake, or ocean.

The goals of the Altamaha Ecosystem Team are (USFWS, no date-b):

1. Protect and restore water quality/quantity and timing of rivers, streams, aquifers, and estuaries in the ecosystem.
2. Protect, conserve, and enhance endangered species, migratory birds, and other fish and wildlife trust resources and their habitats in the Altamaha Ecosystem.
3. Identify and pursue proactive approaches to conserve coastal resources.
4. Conserve, enhance, and manage trust resources through involving and informing the public, partners, and decision-makers in the Altamaha Ecosystem.

## **REGIONAL CONSERVATION PLANS AND INITIATIVES**

The State Wildlife Grants (SWG) program began in Fiscal Year 2002. Under this new program, Congress provided an historic opportunity for state fish and wildlife agencies and their partners to design and implement a more comprehensive approach to the conservation of America's wildlife. A requirement of SWG was that each state would complete a Comprehensive Wildlife Conservation Strategy (CWCS) by October 1, 2005. Development of the CWCS was intended to identify and focus management on "species in greatest need of conservation." Congress expects SWG funds to be used to manage and conserve declining species and avoid their potential listing under the Endangered Species Act.

In December 2002, the Georgia DNR's Wildlife Resources Division (WRD) began a process to develop a comprehensive wildlife conservation strategy (GADNR 2005). Through the Wildlife Conservation and Reinvestment Program, WRD made a commitment to develop and begin implementation of this CWCS by October 1, 2005. Funding for this planning effort came from a federal grant to WRD through the SWG program; matching funds were provided through Georgia's Nongame Wildlife Conservation Fund. The goal of the strategy is to conserve Georgia's animals, plants, and natural habitats through proactive measures, emphasizing voluntary and incentive-based programs on private lands, habitat restoration, and management by public agencies and private conservation organizations, rare species survey and recovery efforts, and environmental education and public outreach activities. The Georgia CWCS was approved by the Service in August 2005.

Components of this planning effort included: (1) Development of databases on rare species and natural communities; (2) identification of high-priority species and habitats; (3) identification of high-priority research and biological inventory needs; (4) surveys for rare species on public and private lands; (5) development of databases of conservation lands and high-priority watersheds and landscapes; (6) prioritization of conservation, education, and habitat protection needs; (7) collaboration with state and federal agencies on habitat protection/restoration plans; (8) technical assistance to private conservation organizations and local governments; (9) review of existing conservation laws, rules, and policies; and (10) public input and educational outreach.



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The following goals represent important themes in the conservation strategy:

- Maintain known viable populations of all high-priority species and functional examples of all high-priority habitats through voluntary land protection and incentive-based habitat management programs on private lands and habitat restoration and management on public lands.
- Increase public awareness of high-priority species and habitats by developing educational messages and lesson plans for use in environmental education facilities, local schools, and other facilities.
- Facilitate restoration of important wildlife habitats through reintroduction of prescribed fire, hydrologic enhancements, and vegetation restoration.
- Conduct statewide assessments of rare natural communities and habitats that support species of conservation concern.
- Improve efforts to protect vulnerable and ecologically important habitats, such as isolated wetlands, headwater streams, and caves.
- Combat the spread of invasive/noxious species in high-priority natural habitats by identifying problem areas, providing technical and financial assistance, developing specific educational messages, and managing exotic species populations on public lands.
- Minimize impacts from development and other activities on high-priority species and habitats by improving environmental review procedures and facilitating training for and compliance with best management practices.
- Update the state protected species list and work with conservation partners to improve management of these species and their habitats.
- Conduct targeted field inventories of neglected taxonomic groups, including invertebrates and nonvascular plants.
- Continue efforts to recover federally listed species through implementation of recovery plans, and restore populations of other high-priority species.
- Establish a consistent source of state funding for land protection to support wildlife conservation, and increase availability and use of federal funds for land acquisition and management.
- Continue efforts to monitor land use changes statewide and in each ecoregion, and use predictive models to assess impacts to high-priority species and habitats.

Six technical teams focused on the following groups of species: birds, amphibians and reptiles, mammals, fishes and aquatic invertebrates, terrestrial invertebrates, and plants. These technical teams consulted numerous data sources and used a variety of criteria to identify high-priority species for Georgia; these included critically imperiled species, habitat indicator species known to be in decline, species endemic to Georgia, and rare or uncommon species in need of further research to determine conservation objectives. Ranges of distribution, habitat associations, conservation needs, and research priorities for 296 species of high-priority animals and 323 species of high-priority plants are outlined. Similarly, high-priority habitats are defined for each ecoregion and management needs for these habitats are discussed.

## **ECOLOGICAL THREATS AND PROBLEMS**

### *HABITAT LOSS AND FRAGMENTATION*

Forested wetland habitat has been disappearing at an increasing rate over the last several decades. This is particularly true of the southeastern United States, where it is estimated that over 90 percent of the total forested wetland habitat loss occurred between the mid-1950s and the mid-1970s (Keeland et al. 1995). Since the mid-1970s, loss of forested wetlands has accounted for 95 percent of all palustrine wetland losses.

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The increase in human population in Georgia over two centuries through 1980 can be extrapolated to indicate increasing pressures on natural resources as more natural habitat is impacted through an expanding population. The percentage change in population by county for the last 10 years of this period signifies a trend of population expansion out from urban centers into the traditionally more rural counties (GADNR 2005).

In 1987, the Kellogg Physical Resources Task Force published a final report entitled "The Georgia Landscape: A Changing Resource," documenting the effects of land use change in Georgia from 1935 to 1985 (Odum and Turner 1987). Changes during this time period were characterized as extensive and dramatic. In the 1930s, the Georgia landscape was very fragmented with many small, irregularly shaped tracts of open and forested land. Today, the landscape is much less patchy with field and forest tracts larger and more regular in shape, and urban areas larger. Because of their very high-energy consumption per unit of area, metropolitan areas increasingly impact the life-supporting resources in the surrounding countryside. The amount of "edge" between land types has decreased over this 50-year period, a change that has had a major effect on many populations of birds and other animals.

Since the time of the studies conducted by the Kellogg Physical Resources Task Force, urban sprawl has increased dramatically. The habitat losses and modifications attributed to increases in suburban areas, including stream habitat losses due to construction of the water supply reservoirs accompanying suburban growth, represent the primary long-term threats to wildlife diversity in Georgia. Other important stressors of wildlife habitats and species include conversion of natural habitats for agricultural or silvicultural uses, as well as activities associated with existing agricultural and forestry operations that do not meet the standards of best management practices.

Fragmentation of bottomland hardwood forests has left many of the remaining forested tracts as biological oases surrounded by inhospitable agricultural lands. Intensive agriculture has removed most of the forested corridors along sloughs that formerly connected forest patches. The loss of connectivity between the remaining forested tracts hinders the movement of a large range of wildlife between tracts, and reduces the functional value of many remaining smaller forest tracts. The severed connections also result in a loss of gene flow needed to maintain genetic viability and diversity within wildlife populations. Thus, remaining populations are rendered even more vulnerable to habitat modification and degradation. Particularly for wide-ranging species, reestablishing travel corridors to allow movement is of critical importance.

The Macon area has continued to expand mostly toward western and northern Bibb County. The area south of Macon has also experienced growth, primarily in the form of single family residential development both to the north and south of the refuge.

#### *COMMERCIAL EXPANSION*

The floodplains of the Ocmulgee River near Macon have been subjected to increased demands from development. A majority of these bottomland forests has been extensively harvested for timber and portions have been cleared for agricultural purposes. The rich mineral soils have been used for manufacturing bricks and masonry, while adjacent uplands have been subjected to kaolin mining.

Portions of the refuge, east of the railroad, show evidence of past logging operations. Larger diameter class pines have been removed from the drier, upland areas, while some hardwood was cut from the more accessible bottomlands. Forested areas in the immediate vicinity of the refuge have also been harvested. Areas, which were formerly inaccessible to conventional harvesting, are being logged, using helicopters to remove timber.

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The focus of mining for mineral resources is on kaolin and Fuller's earth on the upland areas and refractory clays on the floodplains. Extensive mining operations of kaolin deposits have been established, particularly in Twiggs County. Mining companies own or have interests in the abundant kaolin deposits in the middle Georgia area.

### *ALTERATIONS TO HYDROLOGY*

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.

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

Large-scale, man-made hydrological alterations have changed the spatial and temporal patterns of flooding throughout the entire Altamaha Watershed Ecosystem, in terms of both extent and duration of flooding, in comparison with the natural hydrology regime. This curtailment of the flooding regime has had an enormous impact on the forested wetlands and their associated wetland-dependent species.

Point and non-point pollution of aquatic systems resulting from residential, commercial, and industrial development and various forms of land-disturbing activity represent serious challenges for many of Georgia's species and habitats. According to 2002 data from the Environmental Protection Division, some 2,870 of 11,359 miles of monitored streams in Georgia (25.2 percent) did not support designated uses due to some form of impaired water quality (GADNR 2006a).

The proximity of a large metropolitan urban area to the refuge greatly increases the potential for contamination problems. In general, pollutants in the area are generated as byproducts of industrial production and a concentrated population center. Of primary concern is water quality on the refuge and the Ocmulgee River. Water quality on the refuge is affected seasonally as flood waters inundate wetlands along the floodplain. Additional concerns regarding water quality and contamination involve potential spills from railway traffic, runoff from agricultural areas, and illegal waste disposal.

Although sections of the Ocmulgee River passing through Bond Swamp NWR remain public waters, it is important that refuge staff remain vigilant of proposals that would vary the quantity, quality, timing, or distribution of these waters. The refuge should work with partners to ensure that minimum instream flows are set that protect refuge resources, and that permit winter floods to continue to inundate portions of the refuge. Since 2001, the state has been operating under an interim policy regarding instream flows. This policy does not specify timing of discharges, which means that winter flooding of bottomland systems in Bond Swamp NWR could be jeopardized. Refuge staff should work with the Regional Water Rights Manager, the Division of Ecological Services, appropriate state agencies, and other partners to develop a site-specific instream flow study.

As of 2007, 31 municipalities and industries had been permitted to withdraw a total of roughly 2,500 cfs (more than 4 times the current 7Q10 value) from the Ocmulgee River and its tributaries. All permittees are located upstream of Bond Swamp NWR (EPD 2007). Most of the permitted water withdrawals likely return to the river in the form of treated sewage or releases from electric power facilities. It is unknown how much these returns alter the historic hydrologic regime as a whole, but discharges from Lake Jackson, a hydropower reservoir owned and operated by

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Georgia Power Company, have great effects on the hydrology and bottomland hardwood forest ecology of the refuge (USFWS 2007).

### *PROLIFERATION OF INVASIVE PLANTS AND ANIMALS*

Human activities have resulted in the introduction of many non-native species into the Georgia landscape. Some of these species were deliberately introduced as crop or horticultural plants, livestock, or pets and later escaped from cultivation or domestication. Others, like kudzu, autumn olive, Japanese honeysuckle, and bicolor lespedeza, were introduced to control erosion or provide food for wildlife. Still other exotic species were accidentally introduced by importation of food and other materials. While many of these species are relatively benign or serve as pests primarily of crops, lawns, or orchards, a number of exotic species are capable of invading natural communities and causing severe negative impacts to wildlife. For example, the fire ant has been found to cause mortality to gopher tortoises and southern hognose snakes. Animals like feral hogs have caused extensive habitat damage and alterations. Many exotic pest plants have been identified for the southeast, and techniques for control of these pests are being explored and implemented in various habitats. Severe infestations of exotic species exist on public conservation lands as well as on private lands, and responding to this form of "biological pollution" will be a major task for land managers in the future.

Several exotic invasive plants are of concern at Bond Swamp NWR, including privet, kudzu (*Pueraria montana*), Chinese tallow (*Sapium sebiferum*), Nepalese browntop (*Microstegium vimineum*), Chinaberry (*Melia azedarach*), mimosa or silk tree (*Albizia julibrissin*), and non-native wisterias (*Wisteria sinensis* and *W. floribunda*) (USFWS 2007).

Feral hogs occur in many of the bottomland hardwood habitats throughout Georgia, including Bond Swamp NWR. They are an exotic invasive species that can cause extensive damage to a variety of habitats. Feral hogs consume items from across the food web, including hard and soft mast, roots and other vegetation, invertebrates, amphibians, reptiles, bird eggs and young, small mammals, the young of larger mammals, agricultural crops, and carrion. Feeding activity by feral hogs turns over and uproots the forest floor, causing damage to seedlings, herbaceous and other sensitive plant communities, litter development, and soil structure. Feral hogs directly compete with other wildlife through removal of large amounts of a variety of food items. In addition, through direct consumption and habitat disruption, they can lead to unsustainable levels of mortality to a number of amphibian species.

## **PHYSICAL RESOURCES**

### *CLIMATE*

Located near the geographical center of Georgia, the refuge is subjected to moderate climatic conditions throughout the year. The climate is a blend of maritime and continental types. Rarely does either system dominate for extended periods. The average yearly rainfall, as measured in Macon from 1971-2000, is 45 inches, with rainfall reasonably well distributed throughout the year, although winter is the wettest season (NOAA, no date). During that period, January was the wettest month at 5.0 inches and October was the driest at 2.37 inches. Severe storms occur occasionally in this area. Tornadoes occur approximately twice each year in middle Georgia (USFWS 1989). Thunderstorms occur on an average of two days out of five during the period June through August. Snow occurs at some time during most winters, but amounts are usually small as evidenced by monthly means of 0.1 to 0.9 inches. The heaviest snowfall over a 24-hour period occurred in February 1973 with 16.5 inches (NOAA, no date).

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January is usually the coldest month, with a mean temperature of 45.5 degrees Fahrenheit, with an average daily minimum of 35.5 degrees (NOAA, no date). July is normally the hottest, with mean temperatures of 81.1 degrees and an average daily maximum of 91.8 degrees. Winters are mild, with temperatures seldom remaining below freezing for long. The prevailing northwesterly winds of winter and early spring are frequently superseded by southerly flows of warm, moist tropical air.

### *GEOLOGY AND TOPOGRAPHY*

Geology of the refuge is dominated by the Tuscaloosa formation (USFWS 1989). The Tuscaloosa formation is the oldest outcropping formation of the Coastal Plain of Georgia. It extends into Georgia from the vicinity of Tuscaloosa, Alabama, where it is typically exposed. It crops out as an irregular band, generally less than 15 miles wide, bordering the Piedmont province.

The Tuscaloosa formation consists of light-colored sand, sandy clay, and lenticular masses of clay. The formation in Bibb County is characterized by fine to coarse sand, in places mingled with white kaolin and in others separated by lenticular and pure kaolin masses. In northern Twiggs County, the Tuscaloosa formation consists of clay, sand, and gravel.

East of the Ocmulgee River, along the interstream area, outlying bodies of the late Eocene age occur. The deposits consist of Barnwell formation massive deep-red clayey sand, beds of green or gray Fuller's earth type clay, and beds of limestone with spotty outcroppings.

Alluvial deposits bordering the Ocmulgee River and some parts of the larger creeks are the youngest sediments in the area. They are of Pleistocene and Recent age. These deposits are composed of unsorted clay, sand, and gravel.

### *SOILS*

The majority of soils on the refuge are categorized as Chewacla – Congaree – Hydroquents (USFWS 1989). These soils are typical of the floodplain of the Ocmulgee River and its tributaries. This soil type encompasses approximately 20 percent of Bibb County and generally consists of approximately 74 percent Chewacla soils, 14 percent Congaree soils, 8 percent Hydroquents, and 4 percent of other soil types. This soils type has low relief and generally has slopes of less than 2 percent. They are generally found in areas with high potential for flooding.

Upland sites on the refuge contain soils which belong to the Vaucluse – Lakeland and Vaucluse – Cowarts – Ailey classifications. These soil types combined, encompasses approximately 22 percent of Bibb County.

Alluvial clay deposits are found at the bottom of the Ocmulgee River. This material is used for the manufacture of bricks and other ceramics. Fuller's earth is used as an absorbent. Deposits have been reported throughout the Tertiary area of Macon and Bibb County. Kaolin is a type of clay that is mined mainly for use in making paper, plastics, rubber, paints, and many other products. Twiggs County is one of three counties that combined, produces 75 percent of the national output of kaolin.

### *HYDROLOGY AND WATER QUALITY*

Bond Swamp NWR straddles the Ocmulgee River, and includes long sections of several important tributaries, including Stone and Tobesofkee Creeks. The refuge also includes other minor drainages, and low swampy areas that remain "wet" for much of the year. Several reservoirs and accompanying utility interests along drainages upstream from Bond Swamp NWR have led to altered hydrologic

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dynamics at the refuge (USFWS 2007). Such deviations from more natural hydrologic regimes are readily discernible, but their effects on natural systems at Bond Swamp NWR remain poorly understood. Seasonal flooding (primarily October- March) of many acres of riverine bottomland forests still occurs with regularity. Typically, the refuge floods 5-6 times a year with flood events lasting from a couple of days to 2-3 weeks. Although the river will return to normal levels quickly, the swamp often holds flood waters for several weeks afterward. The extent and frequency at which "natural" flooding occurs at Bond Swamp NWR is in large part affected by hydro power operations at Lake Jackson, upstream along the Ocmulgee River. Other than influencing outflows from upstream dams and utilities, there is no capacity to manage water levels or areas subject to inundation.

The drainage system consisting of numerous streams and tributaries flowing out of the Piedmont region is part of the Alcovy/Ocmulgee Corridor. This corridor flows through both the Coastal Plain and Piedmont provinces. Stone Creek, which flows into the refuge wetland area and forms much of the rich bottomlands, has been classified as a fishing stream.

The Ocmulgee River bisects the refuge. This stretch of river has also been classified as a fishing stream. Though quite turbid in the winter and spring months, the general water quality in the entire Ocmulgee River basin is very good (USFWS 1999). The Ocmulgee River, via Lucas Lake Reservoir, is the water source for the Macon Water Authority (MWA) which serves the city of Macon, Bibb County, and portions of Monroe and Jones Counties. In 1989 MWA pumped more than 35 million gallons of water per day from the river (USFWS 1989) but withdrawals now are 28 million gallons per day (MVA 2009). At Macon, the Ocmulgee River had an average daily flow of 1,740 million gallons. Drought conditions have at times severely reduced this flow rate and shall do so again in the future. The Ocmulgee River, south of Macon, historically had water quality problems due to point discharges such as pulp/paper manufacturing and urban sewage effluent. These problems have been corrected due to the Clean Water Act and resulting regulation. Nationally the primary causes of water impairment are not related to stormwater runoff/non-point pollution and many of the water quality impairments in the Ocmulgee watershed are due to such runoff.

The Ocmulgee River from Macon to downstream of Bond Swamp NWR is on the 2002 EPA 303(d) list of impaired waters for the presence of poly-chlorinated biphenyls (PCBs). The draft 2006 303(d) list also includes the impairments of fecal coliform and low dissolved oxygen, likely caused by urban runoff. Tobesofkee Creek is also listed for fecal coliform and low dissolved oxygen. Another significant threat to water quality is mercury. Plant Scherer has been identified as the largest emitter of mercury in Georgia. Its burning of coal accounts for 40 percent of the state's emissions, and roughly a third of this falls within 90 miles of the source. Bond Swamp NWR is located approximately 30 miles from Plant Scherer. Mercury contamination would negatively affect the refuge's aquatic resources.

Groundwater is supplied by the interface of the Clayton and Jacksonian aquifers. The sand and gravel beds of the Tuscaloosa formation are the most productive sources of ground water in the area. The largest consumer of groundwater near the refuge is the kaolin processing plant at Huber. Groundwater quality is generally good; it is clear and has a slight sulfur taste.

The forested wetlands on the refuge provide a haven for a rich diversity of fish and wildlife and serve to enhance the quality of the area's water resources. These wetland areas act as a safety valve in detaining overflows during flood periods and as water storage basins during dry seasons. The water resources in these wetlands replenish both surface and ground water systems. Water passing through is filtered by a natural process that aids in removal of organic and inorganic wastes, as well as silt and other sediments.

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## AIR QUALITY

Air quality is generally good with the exception of an average of two episodes per year when stagnant conditions persist for short periods. The Georgia ambient air monitoring network provides information on the measured concentrations of criteria and non-criteria pollutants at selected locations, including three Macon sites (GADNR 2006a). From 2001 to 2006, Macon exceeded the ozone standard an average of three times, but no other parameters were exceeded (GADNR, no date-a).

## BIOLOGICAL RESOURCES

### HABITAT

Of the current 7,348 acres administered under Bond Swamp NWR, general habitats and approximate acreages include (USFWS 2007):

Mixed Hardwood-Pine Uplands	1,040
Forested Wetlands	6,108
Streams and Beaver Ponds	200

No systematic vegetation inventories or surveys of Bond Swamp NWR have been conducted. However, based on topography, soils and climate, two principal climax communities are expected on the refuge: southern mixed forest and oak-hickory-pine forest. General species composition of major habitats on the refuge can be inferred from these climax community types, with more specific information coming from observations made during site visits and other field work.

### Bottomland Hardwood and Swamp

In bottomland hardwood and swamp forest types, principle overstory species on the refuge include: water tupelo (*Nyssa aquatica*); black gum (*Nyssa sylvatica*); red maple (*Acer rubrum*); sweet gum (*Liquidambar styraciflua*); elm (*Ulmus* spp.); ash (*Fraxinus* spp.); hickory (*Carya* spp.); and water, willow, overcup and swamp chestnut oaks (*Quercus nigra*, *Q. phellos*, *Q. lyrata*, and *Q. michauxii*). Swamp forests are essentially the lowest areas of bottomland systems, and are distinguished as being subject to extended or very regular periods of inundation. As bottomland forests grade into swamps, tree species diversity decreases and forests tend towards dominance by water tupelo and, at least historically, bald cypress (*Taxodium distichum*). Beaver ponds and oxbow-type lakes can lead to significant portions of refuge floodplains remaining inundated throughout the year, allowing establishment of submerged and emergent aquatic plant communities.

Common mid- and under-story species in bottomlands on Bond Swamp NWR include: poison ivy (*Toxicodendron radicans*), rattan vine (*Berchemia scandens*), flowering dogwood (*Cornus florida*), Eastern hophornbeam (*Ostrya virginiana*), boxelder (*Acer negundo*), privet (*Ligustrum* spp.), and others. Giant cane (*Arundinaria gigantea*) is present sporadically in small patches.

Though other factors are at play, the development and complexity of understory layers is principally influenced by the combined effects of light penetration and hydrologic forces that affect growth, survival, and recruitment of shrubs, vines, and small trees. Significant patches of bottomland forest habitat on the refuge are closed canopied and lack understory complexity, particularly in interior stands away from roads, old logging operations, and other disturbed areas. Nonetheless, areas do exist where mid- and under-story strata are quite well developed, providing important structure and foraging/nesting substrates for many wildlife species.

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## Upland Forests

Upland systems at Bond Swamp NWR can broadly be classified as oak-hickory-pine. Chief overstory species include: hickories; sweetgum; white oak (*Q. alba*); persimmon (*Diospyros virginiana*); tulip poplar (*Liriodendron tulipifera*); and loblolly, shortleaf, and longleaf pines (*Pinus taeda*, *P. echinata*, and *P. palustris*). Mixed forest types on the refuge are typically hardwood dominated. The fire tolerant/dependent pines now comprise only a minor component of upland stands, presumably due to the exclusion and suppression of fire, and resultant hardwood encroachment. Hardwoods can shade and suppress existing pine trees, and preclude the establishment of future pine cohorts through shading and competition for space and nutrients. Advance regeneration of softwood species appears to be lacking in much of the uplands at Bond Swamp NWR. A mixture of understory species includes dogwood, red bud (*Cercis canadensis*), and greenbriar.

## Beaver Swamps/Rock Outcroppings

Other minor habitats on the refuge include rock outcrops, beaver ponds, and ravines that are important in contributing plant and wildlife diversity to the overall refuge landscape. Rock outcroppings are spectacular Piedmont ecosystems. They occur in a zone almost entirely across the Piedmont. The outcroppings located on Brown's and Bull's mountains represent the southernmost such communities in the state. Outcroppings present opportunities to observe the earliest plant successional stages, including lichens and mosses. Federally endangered fringed campion (*Silene polypetala*) and relict trillium (*Trillium reliquum*) could occur on the refuge given the presence of known populations nearby. State threatened *Nestronia* (*Nestronia umbellula*) was found on an upland site adjacent to rock outcroppings during the Biological Review (USFWS 2007). The rare lobed spleenwort (*Asplenium pinnatifidum*) may possibly be found on these limestone outcroppings.

Much of the floodplain remains inundated throughout the year due to beaver swamps and oxbow-type lakes. Many species of moist-soil and aquatic plants establish in these areas, including cattail, sedges, rushes, arrowhead, pond weed, duck weed, and water shield. Button bush is a common understory species along with river cane and alder. Principle tree species include willows, ash, and maples.

## WILDLIFE

### Mammals

Fifty species of mammals could occur on the refuge. White-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), cottontail rabbit (*Sylvilagus floridanus*), and gray fox (*Urocyon cinereoargenteus*) occur commonly. The refuge and surrounding lands support low numbers of black bear (*Ursus americanus*) from one of three recognized populations in Georgia. Coyotes (*Canis latrans*) and beaver (*Castor canadensis*) also occur, and like feral hogs (*Sus scrofa*), can have important impacts on habitats and other wildlife on the refuge. Because the conditions at Bond Swamp NWR favor the eventual development of climax forests, wildlife species adapted to mature forest conditions will be favored over time relative to species that are more dependent upon disturbance and/or successional habitat stages. Other more diminutive species (e.g., shrews, rodents, and bats) are also likely to occur based on existing habitat conditions.

### Amphibians and Reptiles

The combination of warm weather and wet areas at Bond Swamp NWR provides ideal conditions for a variety of reptile and amphibian species. About 80 species of reptiles and amphibians could occur on the refuge, including 26 species of snakes, 10 species of lizards, 12 species of turtles, 13 species



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of salamanders, and 18 species of toads and frogs. Although Bond Swamp NWR is on the northern edge of the range for the American alligator (*Alligator mississippiensis*), it is occasionally seen on the refuge, especially on warm, sunny days. Alligators up to 10 feet in length have been documented on the refuge. There are several species of poisonous snakes, including cottonmouths, copperheads, and rattlesnakes. Other common reptiles and amphibians that might be encountered at Bond Swamp NWR include the box turtle (*Terrapene carolina*), eastern king snake (*Lampropeltis getula*), snapping turtle (*Chelydra serpentina*), green treefrog (*Hyla cinerea*) and southern fence lizard (*Sceloporus undulatus*). No reptile or amphibian species of special concern are known from Bond Swamp NWR, though several are possible, such as Southern dusky salamander (*Desmognathus auriculatus*) and spotted turtle (*Clemmys guttata*). Uplands could possibly support the poorly known coal skink (*Eumeces anthracinus*), and with reintroductions and appropriate habitat management, uplands could also support the state threatened gopher tortoise (*Gopherus polyphemus*).

## Birds

Approximately 200 bird species are believed to occur on the refuge. Many species of waterfowl, waterbirds, shorebirds, and neotropical songbirds pass through, over-winter, or nest in Bond Swamp NWR as they follow their seasonal migration routes. Waterfowl make extensive use of the wetlands and naturally flooded bottomlands during non-breeding periods (Sept-March). Mallard (*Anas platyrhynchos*), American black duck (*A. rubripes*), blue-winged teal (*A. discors*), wood duck (*Aix sponsa*), and ring-necked duck (*Aythya collaris*) are the most common species during these months. The Bond Swamp NWR area supports one of the most significant concentrations of wintering waterfowl in middle Georgia. Though the flooded swamps of the Ocmulgee River and vicinity are difficult to survey accurately, and surveys are no longer flown, recent estimates indicate peak midwinter waterfowl use at 3,000-5,000 birds. The area contains outstanding wood duck habitat, and several thousand wood ducks remain or return to the refuge to breed. Isolated beaver ponds and adjacent forests provide exceptional foraging habitat and rookery sites for herons, egrets, ibis, and anhingas (*Anhinga anhinga*).

The floodplain forests of the refuge are an important habitat supporting the conservation of dozens of species of resident and migratory landbirds, many of which are designated as priorities due to continued concern over declining populations, habitat threats, and other factors. Priority neotropical migratory birds found breeding on Bond Swamp NWR include Swainson's warbler (*Limnothlypis swainsonii*), prothonotary warbler (*Protonotaria citrea*), yellow-billed cuckoo (*Coccyzus americanus*), Acadian flycatcher (*Empidonax vireescens*), and wood thrush (*Hylocichla mustelina*). A single pair of bald eagles (*Haliaeetus leucocephalus*) has been nesting on the refuge, and others may utilize the refuge in nonbreeding seasons. Other occurring bird species include woodpeckers, doves, kingfishers, hummingbirds, hawks, owls, and Caprimulgids (nocturnal birds). American woodcock (*Scolopax minor*) and wild turkey (*Melagris gallopavo*) are two important gamebird species found on the refuge. The refuge and surrounding lands form one of the largest remaining blocks of forested wetlands in Georgia, and their conservation is critical to the many species of landbirds that require large, relatively unfragmented forest systems to successfully breed and sustain their populations. At the same time, heterogeneity in forest age, structure, and composition is important in providing the full complement of resources and structural characteristics necessary to support a diversity of bottomland forest birds.

## Fish

The Ocumulgee River, and Stone and Tobesofkee Creeks are the three principal waterways on Bond Swamp NWR and all are classified as fishing streams. The dynamic nature of the flooding regimes along these waterways and adjacent floodplains provides a constantly renewable fishery supporting a diversity

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of warmwater species (approximately 100) including largemouth bass (*Micropterus salmoides*), spotted bass (*M. punctuatus*), crappie (*Pomoxis* spp.), bluegill (*Lepomis macrochirus*), and white catfish (*Ictalurus catus*). Due to the lack of significant downstream obstructions, several anadromous species also occur in the Ocmulgee system, including striped bass (*Morone saxatilis*), American eel (*Anguilla rostrata*), and the federally endangered shortnose sturgeon (*Acipenser brevirostrum*). Several species of freshwater mussels and many other species of fish are possible on the refuge.

## Invertebrates

Approximately half of the expected butterfly species for the region have been documented on Bond Swamp NWR. Many of the 63 species of butterflies that have been identified are species of concern in Georgia (Johnson 2006). It is likely that many of the others occur here, but perhaps infrequently or in limited numbers. Many species require specific host plants to complete their life cycles, and a number of such host plants require forest openings, early successional patches, and other sunlit areas to thrive. Several butterfly species tied to cane and sedges have been found, but in general, the relatively uniform forested habitats of Bond Swamp NWR are not likely to sustain thriving populations of butterfly species dependent on successional plant communities. Management of utility rights-of-way may provide some opportunities. Some of the more common species tied to mature bottomlands and found on the refuge include the American snout (*Libytheana carinenta*), hackberry emperor (*Asterocampa celtis*), and tawny emperor (*A. clyton*).

## THREATENED AND ENDANGERED SPECIES

There are two possible occurrences on the refuge of plant species listed on the Federal Endangered Species List. These are the fringed campion (*Silene polypetala*) – endangered; and the relict trillium (*Trillium reliquum*) – endangered. Both of these species are also on the protected plant list of Georgia (GADNR 2007a), along with five additional species listed as occurring in Bibb and Twiggs Counties: yellow flytrap (*Sarracenia flava*) – unusual; ovate catchfly (*Silene ovata*) – rare; sweet pitcher-plant (*Sarracenia rubra*) – threatened; Indian olive (*Nestronia umbellula*) – threatened; and the Ocmulgee scullcap (*Scutellaria ocmulgee*) – threatened and a federal candidate.

Two federally listed animal species occur in the area: wood stork (*Mycteria Americana*) and shortnose sturgeon (*Acipenser brevirostrum*). Post-breeding wood storks frequent the refuge and the shortnose sturgeon occurs in the Ocmulgee system. The bald eagle (*Haliaeetus leucocephalus*), which was delisted in June 2007, is still protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. One active bald eagle nest is located on the refuge and is one of 112 in the State of Georgia. In addition to Bond Swamp NWR's year-round resident pair of eagles, during the winter months eagles may temporarily use the refuge as they pass through the region.

A Georgia state listed endangered fish that occurs in the Ocmulgee River is the robust redhorse sucker (*Moxostoma robustum*). This fish lives in Georgia rivers and was once thought to have disappeared from the Ocmulgee River entirely. However, it was rediscovered in the river near Bond Swamp NWR in 1999. The state threatened Altamaha shiner (*Cyprinella xaenura*), the state rare goldstripe darter (*Etheostoma parvipinne*), and the spotted turtle (*Clemys guttata*) are listed as occurring in Bibb and Twiggs Counties, but it is unknown whether these are found on the refuge (GADNR 2006b). The Altamaha spiny mussel (*Elliptio spinosa*) is a federal candidate that has potential to be found on the refuge. The Altamaha arc mussel (*Alasmidonta arcula*) is listed as threatened by the State of Georgia and is also likely to be found in the area assuming appropriate habitat exists (USFWS 2007).

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## INVASIVE SPECIES

The greatest threat to the health of the refuge comes from a non-native mammal, the feral hog. Hogs were introduced to North America by European settlers and have escaped from farms or been released over the years. Feral hogs reproduce quickly in Bond Swamp NWR's rich bottomland hardwood forests and cause a wide variety of environmental damage, including soil erosion and change of natural water flows by their rooting and wallowing. They can spread disease, such as pseudorabies and brucellosis, to domestic pigs and potentially to humans. Feral hogs feed on rare and sensitive native plants, especially wildflowers, allowing non-native weedy species to invade. They compete with native wildlife, such as deer, turkey, squirrels, and bear, for acorns during the fall and winter. Feral hogs can also trample or eat the eggs of ground-nesting birds such as turkey and Kentucky warblers.

The major problem plant species on Bond Swamp NWR are privet, Nepalese browntop (*Microstegium vimineum*), and non-native wisterias (*Wisteria sinensis* and *W. floribunda*). Other exotic invasive plants of concern include kudzu (*Pueraria montana*), Chinese tallow (*Sapium sebiferum*), Chinaberry (*Melia azedarach*), and mimosa or silk tree (*Albizia julibrissin*). Most of the exotics seem to be coming in on roadbeds. These and other exotic species can jeopardize the integrity of refuge habitats, directly affect wildlife, and impede or complicate future management attempts unless they can be monitored and combated. The conclusion reached at the Biological Review (USFWS 2007) was that, given the reality of resources to fight exotics, we could forgo attempts to control rampant privet, Nepalese brown top and wisteria, and instead focus what few resources may become available on species that are just becoming established, such as Chinese tallow.

## CULTURAL RESOURCES

Cultural resources, as defined in the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order 13007 – Protection and Accommodation to “Indian Sacred Sites,” and the Service’s Cultural Resource Management, Policies, Responsibilities, and Definitions (614 FW 1), include any prehistoric or historic district, archaeological site, building, structure, landscape, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). It also includes any artifacts, records, and remains that are related to and located in such properties. These resources must be at least 50 years old or have achieved cultural significance within the last 50 years. ARPA, for purposes of civil or criminal prosecution, states that a historic property must be at least 100 years in age. The term also includes properties of traditional religious and cultural importance, such as traditional cultural properties, listed or eligible for inclusion on the NRHP because of their association with cultural practices, beliefs, or cultural identity of an American Indian tribe.

The middle Georgia region has a rich archaeological and historical heritage. The first human inhabitants were nomadic foragers and hunters who occupied the area prior to 9000 B.C. Among the early inhabitants were the Mississippians (900-1100 A.D.). These chiefdoms were complex agricultural societies centered around large flat-topped mound complexes, such as the ones seen at Ocmulgee National Monument and Kolomoki. An extensive trading network, which had been expanding since the Late Archaic (ca. 3000-1000 B.C.), provided raw materials, such as conch from the Gulf Coast or the Atlantic Coastal Plain, cherts from the Middle Tennessee Valley, copper from eastern Tennessee and northern Michigan, as well as finished goods, such as ceramics. The most notable features of the Mississippian Period in the Ocmulgee River watershed were the flat-topped mounds, circular earth lodges, and rectangular house patterns. Creek Indians inhabited the region during the period of early European settlement (1690-1715).

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Although few systematic archaeological investigations have been conducted on the refuge, a number of significant archaeological and historic sites are located on or near it. The most notable site is Brown's Mount (9BI5). The site, which has been occupied since the Late Archaic, is situated on the summit of a limestone outcrop overlooking the Ocmulgee River and its first terrace. A stone wall once encompassed approximately 60 acres at the summit whose walls were reported to be four feet in height and four to five feet thick (USFWS 1989). The defensive capabilities of the wall were enhanced by elevated platforms and lunettes constructed along the wall at 30-yard intervals and ditches which surrounded the structure both inside and outside the wall. Williams (1993) tentatively dated the wall's construction to the Middle Woodland Period (A.D. 0-600), though this assignment is problematic due to the lack of any Middle Woodland Period ceramics at the site. All evidence of the stone wall disappeared prior to 1935. A council house and an earth lodge, which were excavated by A.R. Kelly in 1935 and Richard Marshall in 1959, were built ca. 980±150 A.D. and occupied for approximately 200 years (Williams 1993; Marshall and Williams 2005). Evidence also exists of two earth mounds that were present, one of a collapsed house probably of a ceremonial nature and the other of a ceremonial council chamber (Williams 1993).

The ruins of Harry Stillwell Edward's small cabin are located on the northeast slope of Brown's Mount. Edwards was a local poet of note. The cabin burned down in the 1930s and all that is left is the limestone chimney and foundation.

The Ocmulgee Old Fields, which includes the Ocmulgee National Monument, Bond Swamp NWR, Central City Park, and privately owned lands in the floodplain, was determined eligible for listing in the National Register of Historic Places as a Traditional Cultural Property (Brockington and Ethnoscience 1999). A Traditional Cultural Property derives its significance from the role that the property plays in a community's historically rooted beliefs, customs, and practices, and in maintaining the continuity of those beliefs, customs, and practices. This area was occupied and served as the political capital of a large area along the Ocmulgee River or as a general hunting area by ancestral Muscogee Creeks. A strong affiliation exists today for modern Creek and Seminole peoples who consider the Ocmulgee Old Fields area as the "cradle of the Muscogee Confederacy."

The Bullard Landing site in the Ocmulgee River floodplain, located at the southern end of the acquisition boundary within the southern expansion area, is an unplowed Late Mississippian period village with 24 small mounds. The major period of occupation of this uniquely preserved village was brief and occurred at about the time of DeSoto's explorations in 1540 (Williams and Evans 1993). The mounds are mostly collapsed earth-covered rectangular structures. The fact that the site has not been plowed implies that most of the artifacts are lying intact where they were left.

There are other smaller archaeological sites on the refuge, such as the Stubbs Mound site and another site that was recently discovered due to vandalism. The Stubbs Mound site, located on the west side of Tobesofkee Creek 0.8-mile up from its junction with the Ocmulgee River, contains a group of four house structures (Williams 1992). Site BS-1HP is a previously unrecorded multi-component site located on a small rise in forested palustrine wetlands immediately west of the Ocmulgee River. A site damage assessment after the vandalism found that it was a small hamlet with at least one homestead from the Late Mississippian Period between 1350 -1540 A.D. (Kanaski 2006). Kanaski recently documented a number of 19<sup>th</sup>–early 20<sup>th</sup> historic period sites. These sites included two farmsteads, a store, clay pits mined for use by local brickyards, and several house sites. Undoubtedly there are many other unrecorded sites on the refuge.

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## **SOCIOECONOMIC ENVIRONMENT**

Bond Swamp NWR includes portions of Bibb and Twiggs Counties about 6 miles south of the city of Macon and within reasonable commuting distance of Robbins Air Force Base (AFB). The area surrounding the refuge offers a blend of urban and rural environments. Robbins AFB is the largest employer in middle Georgia. Land use around the refuge includes both residential and industrial uses. Commercial enterprises focus primarily on timber and kaolin mining. The area is also used extensively for recreational activities. Hunting and fishing are traditional activities for local residents.

Bibb County, which includes the city of Macon, is about four times more densely populated than the state (615 persons per square mile vs. 141 persons per square mile), but growing slower. In 2005, the county's estimated population was 154,918, about two percent of Georgia's population of 9,072,576 (USCB 2006). The county population grew by 0.7 percent from 2000 to 2005, compared to Georgia's 10.8 percent growth in the same five years. From 1990 to 2000, Bibb County grew 2.5 percent compared to Georgia's 26.4 percent in the same decade.

Twiggs County is about four times less densely populated than the state (29 persons per-square-mile vs. 141 persons per-square-mile) and the population is decreasing. In 2005, the county's estimated population was 10,299, much less than one percent of Georgia's population of 9,072,576 (USCB 2006). The county population declined by 2.7 percent from 2000 to 2005, compared to Georgia's 10.8 percent growth in the same five years. From 1990 to 2000, Bibb County grew 8.0 percent compared to Georgia's 26.4 percent in the same decade.

In 2005, of the data available, retail trade was the largest of twenty major economic and employment sectors in Bibb County, followed by accommodation and food services (STATS Indiana 2006). Educational services were the largest sector in Twiggs County. Employment by major industrial sectors is shown in Table 1.

Georgia's statistics are slightly below the national averages for persons below the poverty line, median household and per capita income, and educational attainment levels (USCB,2006). Bibb and Twiggs Counties are both below Georgia's profile in these areas, but Twiggs County fares a little worse (Table 2). In terms of race and ethnicity, whites and blacks dominate both the county and the state populations.

## **REFUGE ADMINISTRATION AND MANAGEMENT**

### *LAND PROTECTION AND CONSERVATION*

#### **Land Acquisition**

The Service acquires lands and interest 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.

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.

**Table 1. Employment of civilian population 16 years and older by industry**

<b>Industry</b>	<b>Bibb County</b>	<b>Twiggs County</b>
<b>Agriculture, Forestry, Hunting</b>	<b>N/A</b>	<b>N/A</b>
<b>Mining</b>	<b>N/A</b>	<b>N/A</b>
<b>Construction</b>	<b>3.8%</b>	<b>4.8%</b>
<b>Manufacturing</b>	<b>N/A</b>	<b>2.6%</b>
<b>Wholesale Trade</b>	<b>N/A</b>	<b>N/A</b>
<b>Retail Trade</b>	<b>12.9%</b>	<b>7.2%</b>
<b>Transportation and Warehousing</b>	<b>N/A</b>	<b>N/A</b>
<b>Utilities</b>	<b>N/A</b>	<b>N/A</b>
<b>Information</b>	<b>N/A</b>	<b>N/A</b>
<b>Finance and Insurance</b>	<b>7.2%</b>	<b>N/A</b>
<b>Real Estate</b>	<b>1.5%</b>	<b>N/A</b>
<b>Professional and Technical Services</b>	<b>2.9%</b>	<b>0.6%</b>
<b>Management of Companies</b>	<b>1.9%</b>	<b>N/A</b>
<b>Waste Services</b>	<b>8.2%</b>	<b>2.7%</b>
<b>Educational Services</b>	<b>N/A</b>	<b>22.4%</b>
<b>Health Care and Social Assistance</b>	<b>N/A</b>	<b>N/A</b>
<b>Arts, Entertainment, Recreation</b>	<b>0.6%</b>	<b>N/A</b>
<b>Accommodation and Food Services</b>	<b>8.4%</b>	<b>N/A</b>
<b>Other Services</b>	<b>N/A</b>	<b>N/A</b>
<b>Public Administration</b>	<b>5.1%</b>	<b>N/A</b>

Source: STATS Indiana, 2006 (Note: N/A = data not available)

**Table 2. Comparison of demographic statistics for Bibb and Twiggs Counties, Georgia, and the USA**

	<b>Bibb County</b>	<b>Twiggs County</b>	<b>Georgia</b>	<b>USA</b>
<b>Median Household Income</b>	\$35,169	\$31,598	\$42,421	\$43,318
<b>Per Capita Income</b>	\$19,058	\$14,259	\$21,154	\$21,587
<b>% Below Poverty</b>	18.9	16.5	13.3	12.5
<b>% High School Graduates</b>	77.2	63.2	78.6	80.4
<b>% Bachelor Degree</b>	21.3	5.4	24.3	24.4
<b>% White</b>	47.6	57.0	66.4	80.4
<b>% Black</b>	50.1	42.3	29.6	12.8
<b>% Hispanic</b>	1.5	1.3	6.8	14.1
<b>% Asian</b>	1.4	0.2	2.6	4.2
<b>% Native American</b>	0.2	0.2	0.3	1.0

Source: USCB, 2006

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 established by an approved appraisal that meets professional standards and federal requirements.

Desirable tracts for acquisition at Bond Swamp NWR fall as very low priorities at national and regional levels relative to other tracts being sought by the Refuge System. The lack of willing sellers is a problem, and those willing to sell have stated purchase prices well over appraised values. The refuge can only pay appraised value.

Since the 1970s, there have been one or more proposals to build an alternate transportation route across the Ocmulgee River between the refuge and the city of Macon. In 1999, the Service committed that it would not actively pursue land acquisition north of Bondsvie Road until this alternate route is determined. This position was based on concerns brought forth by city, county, and state officials who were seeking to avoid Section 4(f) consultation<sup>1</sup> if federal funds are used for any eventual highway construction.

<sup>1</sup> Section 4(f) of the U.S. Department of Transportation Act of 1966 was enacted as a means of protecting publicly-owned public parks, recreation areas, and wildlife/waterfowl refuges as well as historic sites, from conversion to transportation uses. The U. S. DOT has established a review process for any Section 4(f) resource that may be impacted by a federally-aided transportation project or program.

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Acquisition priorities and tracts of interest to the refuge include three small tracts of forested wetlands along the Ocmulgee River at the end of Bondsview Road. These tracts total less than 50 acres. Another includes a 275-acre tract at the end of Reid's Station Road along the Ocmulgee River. This site was recently clearcut by the landowner, and after a recent land survey was found that the cutting extended onto refuge property. Acquiring these in-holdings would be beneficial for refuge operations by providing contiguous management control over the forested wetlands and reducing the complexity of hunting-related law enforcement in the area. Finally, Florida Brick Company owns a 100-acre inholding of forested wetlands and open water pits west of the Ocmulgee River. This tract is actively mined for clay every two to three years. It would be desirable for the same reasons listed above and also because the open water areas provide habitat for wintering waterfowl as well as excellent locations for wildlife observation and recreational fishing.

## **Wildland Fire Management**

It is the policy of the Service to use fire when it is the most appropriate management tool for reaching habitat objectives. Use of prescribed fire to reduce hazardous fuels, and to restore, rehabilitate, and maintain fire-adapted ecosystems, such as more open, pine dominated stands at the refuge, would require the surmounting of substantial logistical and resource constraints. Smoke management is a concern, particularly with several major highways running through or adjacent to the refuge. In addition, accumulation of natural fuels presents an inherent risk, and requires special attention to minimize this risk and return fire safely to the landscape. Presently, fire "management" is conducted in the context of suppression. The response to any natural or artificially occurring fires on the refuge is to control and suppress them, guarding against undesirable habitat damage, smoke danger, and loss to adjacent properties.

## **VISITOR SERVICES**

Executive Order 12996 and the Improvement Act recognized six priority public uses on national wildlife refuges as long as they are compatible with the purposes for which the refuge was established. These include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, which "have been and are expected to continue to be generally compatible uses." However, these uses are by no means the only permitted public uses of national wildlife refuges; other uses have been and can continue to be permitted, provided that they are determined to be compatible with the refuge purposes, including walking dirt/gravel roads, biking dirt/gravel roads, canoeing, and general boating. All-terrain vehicle use is restricted at Bond Swamp NWR (USFWS 2005). Horseback riding is not allowed at Bond Swamp NWR.

Public use opportunities on Bond Swamp NWR have been limited, primarily because Piedmont NWR cannot devote the staff and resources necessary to safely and effectively support them. In addition, there are no refuge maintained roads, so any access would have to be by foot, or the often poorly maintained county roads on the refuge's periphery. Boat access to the refuge is not authorized. Figure 3 shows the refuge's public use facilities.

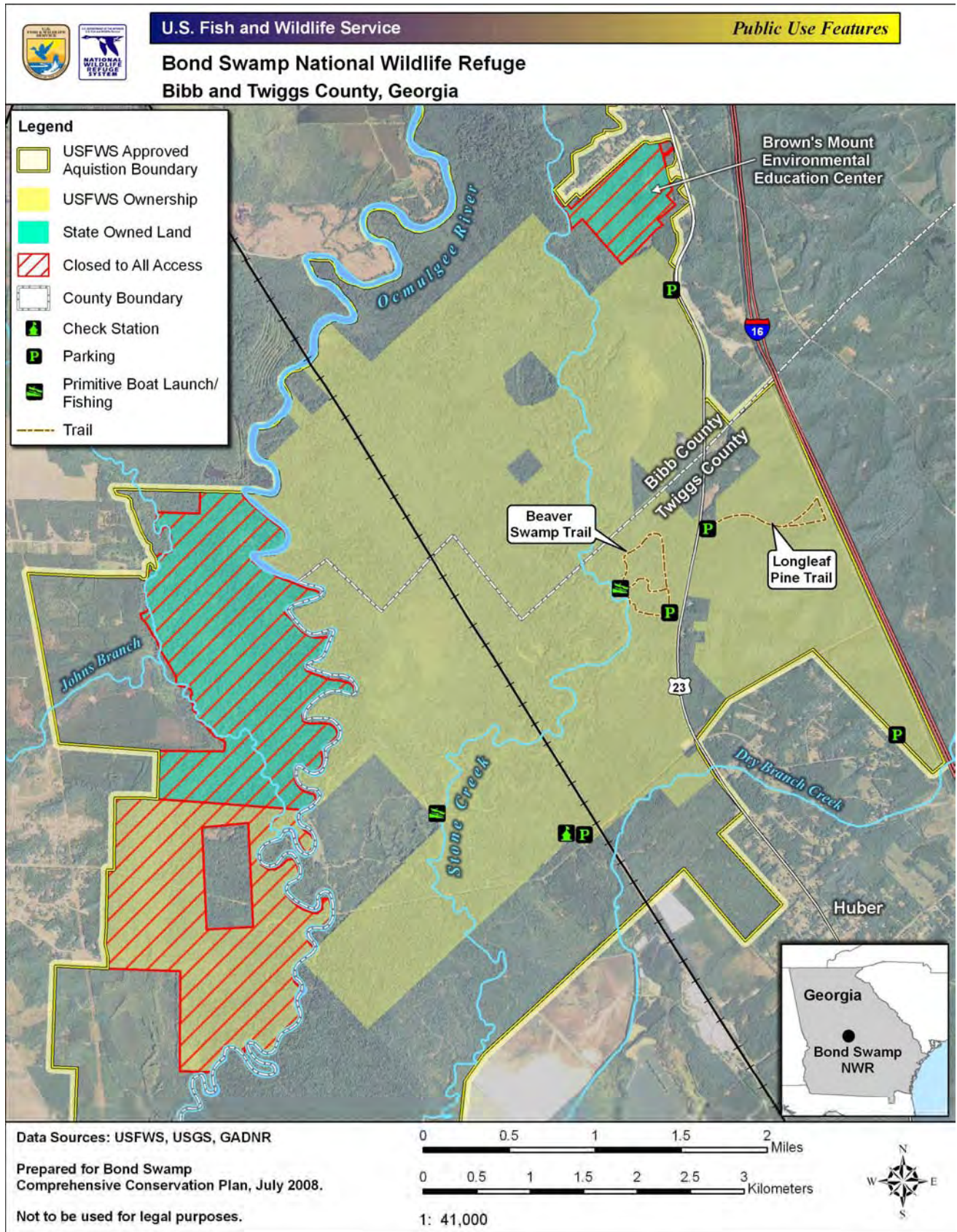
For several years, the refuge was closed to all public use with the exception of certain refuge sanctioned activities (e.g., guided canoe trips). The first true public use on Bond Swamp NWR occurred in 1999 as a result of the refuge's commitments to the Ocmulgee Heritage Greenway

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*The provision states that the Secretary of the U.S. DOT may approve a transportation project requiring the use of publicly owned land only if a) there is no feasible and prudent alternative to using that land, and b) the program or project includes all possible planning to minimize harm to the Section 4(f) property.*



Figure 3. Public use facilities at Bond Swamp NWR



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project. In this year, the refuge held its first public deer hunt, and in 2000, hiking and fishing opportunities were made available. Public use has averaged approximately 8,000-10,000 visitors annually. The refuge is interested in expanding public access and use opportunities, but this is contingent upon compatibility determinations and National Environmental Policy Act compliance, as well as the acquisition of sufficient refuge resources to support such use. The increasingly urbanized landscape around Macon, Georgia, represents a significant and growing potential user base.

## **Hunting**

Hunting is currently restricted to the east side of the Ocmulgee River (Figure 4) and is allowed during a limited time each fall and winter. The refuge hunt plan states that the hunting program objectives are to: (1) Control, and as much as possible eliminate, a large feral hog population that is causing extensive damage to the refuge ecosystem; (2) control and maintain the white-tailed deer population to ecologically compatible levels; and (3) provide the public with compatible wildlife-dependent recreation through the use of a renewable resource. Hunting regulations are provided in a four-fold brochure that is also used as a permit for all hunting and fishing. All hunters are required to sign-in and obtain a free refuge hunt permit.

White-tailed deer and feral hogs are the only species hunted on the refuge. Over 75 percent of Bond Swamp NWR is open to hunting, which is permitted within the framework of state regulations and licensing requirements. An average of 20 deer and 67 hogs has been harvested annually since 2000. Some hunters have asked about gray squirrel, turkey, and waterfowl hunting, which are currently not allowed. According to harvest data, all current hunts are quality events, with good participation.

A refuge hunt permit and sign-in slip are required for all hunters who enter the hunt area during refuge hunts. The refuge is closed to non-hunters during firearm hunts. All game harvested must be checked out at the check station on Reid's Station Road. Hunt access is limited to foot travel from several vehicle access points around the perimeter of the refuge. A four-wheel drive vehicle may be required for county road access, and all-terrain vehicles are not allowed on the refuge.

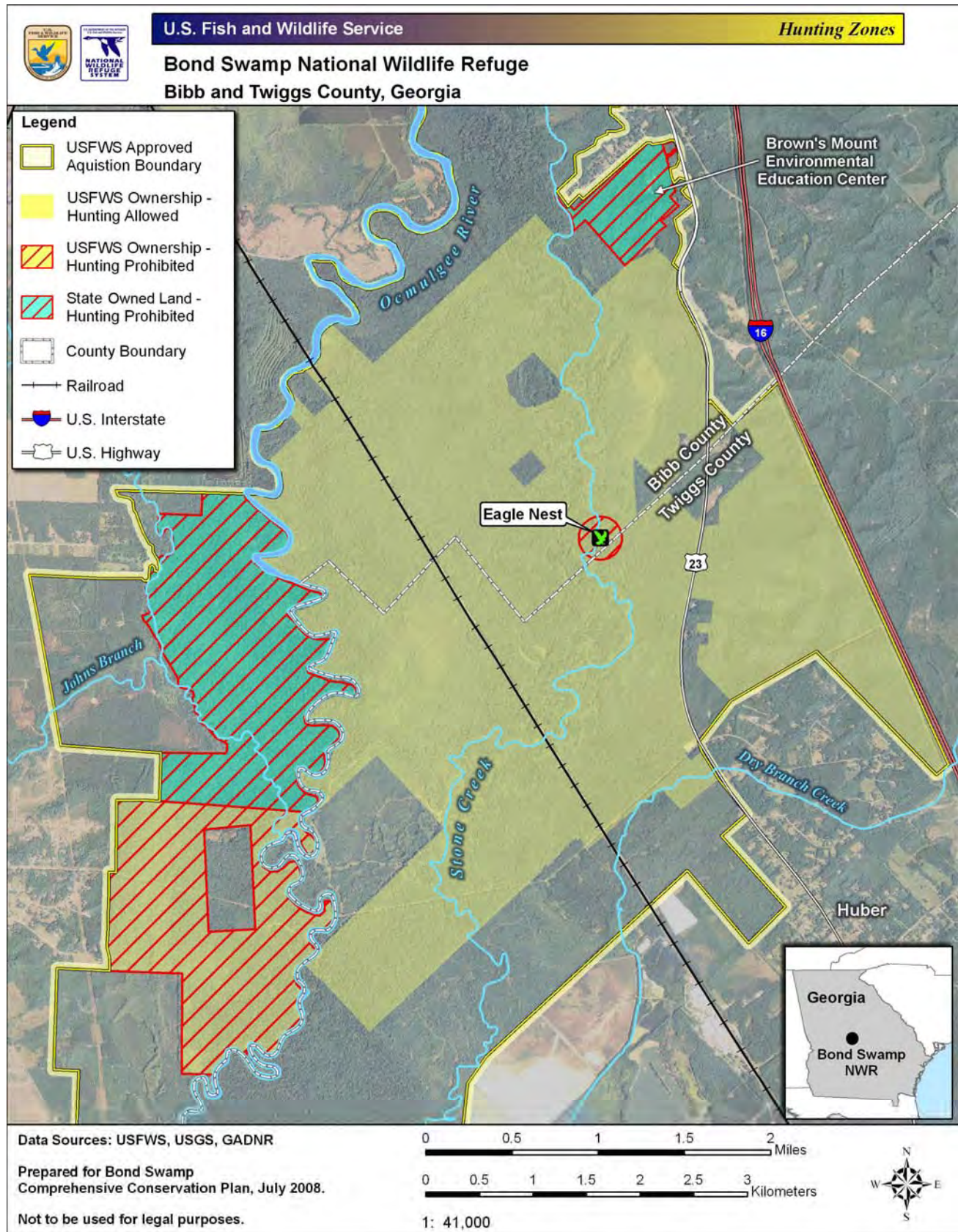
## **Fishing**

Bond Swamp NWR (east side) is open to fishing from March 15-October 15, and is permitted within the framework of state regulations and licensing requirements. A free refuge fishing permit is also required. The refuge offers good fishing opportunities on both the Ocmulgee River and Stone Creek, including largemouth bass, channel catfish, flathead catfish, and several species of sunfish. Fishing permits and regulations are printed on a four-fold brochure. State regulations apply for creel limits, except largemouth bass which must be 14 inches in length to keep. Commercial use is not allowed.

Bank fishing is allowed in all areas not designated as closed. Access to the waters in Bond Swamp NWR requires walking through wooded areas in most cases. Portable boat access is available from the Stone Creek parking area and Reid's Station Road from March 15 to October 15. Gasoline motors are prohibited. No boat ramp is available and the launch site is primitive and has uneven terrain. The refuge has been looking for opportunities for construction funding to improve boat access from the Stone Creek parking.

As part of the Ocmulgee Heritage Greenway effort, consideration is being given to the construction of a public boat ramp on refuge lands along the Ocmulgee River at Bondsvue Road or Reid's Station Road, thereby improving fishing access to the river via boat.

Figure 4. Hunting zones at Bond Swamp NWR



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## **Wildlife Observation and Photography**

Observable wildlife on the refuge includes white-tailed deer, feral hogs, black bears, raccoons, and several rodent species. There are numerous bird species sought by birders. The highlighted species are prothonotary warbler, hooded warbler, Swainson's warbler, and waterfowl, such as the wood duck. There are no observation/photography blinds on the refuge.

Early mornings and later afternoons are the best times to observe and photograph most wildlife, although some reptiles, such as alligators and turtles, may be observed during the heat of the day sunning themselves on exposed areas near the water. Spring bird migration occurs during late March, April and May, and fall migration peaks in September and October. The best way to see Bond Swamp NWR and observe its wildlife is by foot or canoe.

Two hiking trails are currently open. The 1.9-mile Longleaf Pine Trail passes through a mixed pine/hardwood upland forest. The elevation of this trail is high enough to allow year-round use free of flooding. The Beaver Swamp Loop Trail consists of a figure eight with one loop measuring 0.9-mile and the other 1.3 miles. It winds its way along Stone Creek through a bottomland hardwood forest, which often floods and can be impassable. There are numerous foot trails used primarily by hunters that can also be used for wildlife observation; however, these trails are not indicated on general refuge maps.

Access to Stone Creek for wildlife observation is via the Beaver Swamp Trail. Portable boat access is allowed from March 15 to October 15, during the fishing season. No boat ramp is available. The launch site is primitive. After launching boats, vehicles must be parked in the Stone Creek parking lot. State boating laws and equipment requirements are in effect. There is no designated boat access for the Ocmulgee River at this time. Refuge lands west of Ocmulgee River are closed to all public uses at the current time.

The Brown's Mount tract is currently closed to all public access. This 170-acre tract winds through a mixed hardwood forest and has a trail system that leads up to a scenic mountain top. The refuge hopes to open this area to foot travel for wildlife observation and environmental education in the future.

## **Environmental Education and Interpretation**

The refuge conducts environmental education and outreach as requested when resources are available. Educational programs are available to organized school, civic, professional, and conservation groups. Advanced reservations are required for all programs. However, Bond Swamp NWR does not have an established environmental education program. Staffing levels have only allowed on average two programs a year. Bond Swamp NWR information is covered in some of the Piedmont NWR programs. The refuge staff has seen a general trend of decline for program requests.

Via easement, Bond Swamp NWR acquired management control over the Brown's Mount property, which adjoins Bond Swamp NWR, in July 2006. Brown's Mount is owned by the State of Georgia. This site has an education pavilion, restrooms, and parking area. Its close proximity to the city of Macon and Interstate 16 provide numerous outreach opportunities. Tours and hikes of Brown's Mount had been available through a cooperative agreement between the Service and the Macon Museum of Arts and Sciences. However, due to constraints, the museum has ceased conducting programs at the site.

There is no visitor center dedicated exclusively to Bond Swamp NWR. The visitor center located at the Piedmont NWR headquarters has one sign board dedicated to Bond Swamp NWR. It shows the refuge map, describes the importance of the refuge, and identifies some of the common wildlife by sight and sound that can be found on the refuge.

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There are four brochures printed for the refuge including a general refuge brochure; bird checklist; amphibians, fish, mammals, and reptiles list; and hunting and fishing regulations. All brochures are current and up to Service standards. There is also a web site managed for Bond Swamp NWR that is connected with the web site for Piedmont NWR. There are interpretive panels located at Stone Creek, Longleaf Pine Trail, and Brown's Mount parking lots. All panels are well-maintained and informative. All refuge brochures are stocked at these sites.

Due to the lack of staff, there is virtually no staff-directed interpretation on the refuge. In 2005, there was only one staff-led program on the refuge. Groups, such as the local Audubon, utilize the refuge for self-guided tours several times throughout the year. These tours are led by an Audubon Society member.

#### *PERSONNEL, OPERATIONS, AND MAINTENANCE*

As originally intended, Bond Swamp NWR was to be staffed and operated as an independent refuge. However, since its inception, lack of an operational budget led to its being administered under Piedmont NWR, approximately 30 miles to the north. No facilities or equipment are currently located at Bond Swamp NWR, making it logistically more difficult for on-site work to be accomplished. The refuge has one full-time employee (refuge operations specialist); however, the position is slated to be cut, and no annual budget. The refuge operations specialist assigned to Bond Swamp NWR is funded from the Piedmont NWR budget, and has collateral duties there. In 1999, Bond Swamp NWR received a one-time line item in the Piedmont NWR budget to support opening the refuge to the public. Several gravel parking lots, three information kiosks, and three hiking trails were installed. In 2004, the Piedmont NWR interpretive park ranger was reassigned to a new interpretive park ranger position at Bond Swamp NWR. The Piedmont NWR park ranger position was held vacant and then abolished in 2006, while the Bond Swamp NWR position became vacant in 2005, and was also later abolished. The loss of both park ranger positions has impacted public use programs at both refuges.

The annual budget of Piedmont NWR varies and additional cuts are expected over the next 5 years. In FY 2006, basic refuge funding for Piedmont NWR was \$789,000. This does not include the fire program (\$282,000) or deferred maintenance projects. Salary and benefits accounted for \$724K of the base budget in FY 2006, leaving 9 percent of the base funding for operations.

Without an independent budget, the ability to conduct work at Bond Swamp NWR hinges on sufficient staffing at Piedmont NWR. As of January 2007, Piedmont NWR staff comprised the following:

- Project Leader - GS-0485-13
- Deputy Project Leader - GS-0485-12
- Law Enforcement Officer - GS-025-9
- Refuge Operation Specialist - GS-0485-7 (Bond Swamp) \*\*
- Engineering Equipment Operator - WG-5716-10 \*\*
- Engineering Equipment Operator - WG-5716-10
- Office Assistant - GS-0303-6
- Administrative Forester - GS-0460-11
- Forestry Technician - GS-0462-7
- Prescribed Fire Specialist (FIRE) - GS-0401-11
- Forestry Technician (Fire) - GS-0462-5
- Forestry Technician (Fire) - GS-0462-4
- Engineering Equipment Operator (Fire) - WG-5716-8

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Two of these positions (marked with \*\*) have been identified in the Southeast Region Refuge Work Force Plan to be abolished on or before September 2009. No new positions are expected in the next 5 years and additional cuts may occur.

Bond Swamp NWR is open daily during daylight hours, although some access roads and portions of the refuge may be closed during periods of flooding or deer and feral hog hunts.

Primary access to the refuge is by foot or limited county roads around the boundary of the refuge. Three primary parking areas are located on the east side and two are planned for the west side of the Ocmulgee River. There are four established hiking trails open to foot travel only. Boat access is currently limited to a portion of Stone Creek during refuge hunting season by permitted hunters. Boats must be portable and no gas engines are allowed. Boat access from the Ocmulgee River is self-limiting since the two closest public boat ramps are over 30 river miles apart. There are several woods roads that provide foot access into the swamp. These roads are mowed annually prior to hunting season. Currently, ATV access is limited to wheelchair hunters with a refuge special use permit for access on specific foot roads.

There are no directional signs to Bond Swamp NWR on I-16 or on Highway 23. There are signs at the turn into Stone Creek parking area and Longleaf Pine Trail parking area. There are no entry signs at the major entry points onto the refuge. There are signs at the primary parking areas that provide information about the refuge.

There are no "permitted/prohibited" signs at any of the major entry points onto the refuge except at Stone Creek trail head and parking area. There are regulatory signs at the primary parking areas. The boundary is well-signed in some areas, but in other areas the boundary signs are missing or faded.

Maintenance for the parking areas, hunter access trails, and kiosks is provided by staff from Piedmont NWR. The two large gravel parking areas on the refuge are both adjacent to Highway 23. There is also a parking area at Brown's Mount. The refuge has developed a plan to improve the two parking areas adjacent to Highway 23. There are three 6-panel kiosks on the refuge. Each is located at one of the three main parking areas (Stone Creek, Longleaf Pine, and Brown's Mount).

Law enforcement for Bond Swamp NWR is provided by the one full-time refuge officer and one collateral-duty officer located at Piedmont NWR. The refuge officers receive good cooperation from Georgia DNR officers and local police. The refuge officers probably spend 25 percent of their time at Bond Swamp NWR, patrolling and conducting law enforcement work.

### **Partnerships and Volunteers**

Some lands within or managed by Bond Swamp NWR require cooperation with other entities to ensure continued management in ways that are compatible with refuge objectives and the overall conservation objectives for the region.

The refuge was involved with the local Ocmulgee Heritage Greenway effort from 1997 to 2003. We are still working through partnerships with other federal and state agencies, local municipalities, conservation groups, and concerned citizens in conservation efforts along the Ocmulgee River.

The refuge has partnered with Georgia DNR on several efforts including the Robust Redhorse Recovery Project; annual butterfly, wintering waterfowl, and bald eagle surveys; and neotropical bird monitoring. Georgia DNR continues to provide technical assistance with Swainson's warbler and cane monitoring and management.

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The refuge staff cooperates with the public works departments, sheriff departments, and emergency services in Bibb and Twiggs Counties for joint assistance with law enforcement, road work, etc. Georgia DNR is also a law enforcement partner assisting with hunts.

Approximately 1,072 acres are owned fee title by the State of Georgia and managed by Bond Swamp NWR under cooperative agreement. These include Brown's Mount, and the McNair and Timberlake north tracts. Both the state and the refuge have essentially the same over-riding interests in these lands, and they need to develop the specifics of the 50-year management plan that implements the cooperative agreement.

The Norfolk Southern Railroad owns 63 acres of right-of-way (ROW) through the refuge. It maintains the ROW for an active rail line. The rail line is raised on an earthen and rock berm that has numerous bridged crossings over permanently wet areas. Approximately half of the width of the ROW is covered with rock, but the other half has forest cover. No access is permitted on or across the ROW due to safety concern with the active rail line. We continue to look for opportunities to work with the railroad during maintenance or construction operations to ensure the natural resources are protected.

Georgia Power Company maintains 120 acres of utility ROWs that traverse the refuge, primarily with the interest of protecting utility infrastructure. However, many of these acres present excellent opportunities to promote management for open, early successional habitats consistent with utility maintenance. The low, grassy, and herbaceous utility ROW corridors are deemed beneficial for butterflies, providing some of the only extensively open habitats on the refuge.

There is no volunteer program or friends group in place for Bond Swamp NWR. With no on-site facilities and no staff dedicated to the refuge, oversight of volunteers is problematic. However, volunteers do assist with the butterfly survey. With little cohesion among conservation groups in the local area, there is little interest in creating a friends group to support the refuge.





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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 Comprehensive Conservation Plan for Bond Swamp 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.

Generally speaking, scoping refers to the process by which the planning team gathers input from a variety of internal and external sources as to what the key issues, concerns and opportunities are that need to be addressed in the CCP. Internal scoping sources include the refuge staff itself, other Service biologists, and professionals in the region. External scoping sources include concerned private citizens; research and educational institutions; members of conservation, sportsmen and civic groups; refuge neighbors; members of the community; and state, tribal, and local agencies. These various interests are sometimes referred to collectively as stakeholders, that is, those individuals and groups that have a stake in how the refuge is managed. In developing the CCP for the Bond Swamp NWR, the planning team conducted both internal and external scoping.

The first step in developing the refuge's CCP was a biological review that took place during the week of July 25-27, 2006. The review team included 17 Service biologists, managers, foresters, and non-Service managers/biologists. The review involved on-site evaluations to help the refuge meet its purpose and determine the role(s) this refuge could play regarding wildlife needs/objectives at various geographical scales (i.e., local, ecosystem, regional, and national). The approach was to take a holistic look for achieving refuge and landscape-level conservation needs while still giving priority to accomplishing the original purpose of refuge establishment. The biological review report was completed and signed in August 2007 (USFWS 2007). The review includes background information on the refuge that was evaluated by reviewers. Based on this examination, a series of recommendations developed by the review team were then made with the intent of articulating fairly specific management and conservation actions that the staff should consider undertaking in order to fulfill the refuge's conservation roles. In keeping with the terminology and expected outcomes of the CCP process, these recommendations took the form of goals, objectives, and strategies for the management of the refuge's biological resources. These preliminary goals, objectives, and strategies were studied by the CCP planning team and modified and adapted for this CCP/EA.

A visitor services review was also conducted in 2006 in preparation for the upcoming CCP. The 3-member review team consisted of Service personnel from the Region – Visitor Services and Outreach, Region 4 Regional Office, a representative of St. Marks NWR, and a representative of J.N. “Ding” Darling NWR. The review team met with refuge staff to discuss the visitor services program. The project leader, deputy project leader, and refuge officer explained what the visitor services program is currently doing to provide recreational, educational, and interpretive opportunities on the refuge. The staff and team toured all the different public use areas on the refuge. After discussions with some of the staff and the refuge tour, the review team met to discuss the current status of the programs and to make recommendations. On the final day of the review, the team presented the

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recommendations to the staff and had an open discussion of the pros and cons of the various recommendations. Later the team prepared a report, which was completed and signed in July 2006, with a number of recommendations for improving and expanding upon visitor services facilities and operations (USFWS 2007).

The nucleus of the CCP planning team itself – composed of Piedmont NWR's project leader, deputy project leader, forester, and refuge officer, Bond Swamp NWR's operations specialist, and a contractor with experience in preparing CCP's – met for the first time on October 17-18, 2006, for a tour of the refuge and an overview of its habitat and wildlife resources and public use programs, facilities, and opportunities. At this time, the planning team also conducted additional internal scoping and prepared a preliminary schedule and plans for public involvement. An internal Alternatives, Goals, and Objectives Workshop was held in which Georgia participated as part of the planning team. Tribal groups were also invited to participate on the planning team.

Scoping continued with an open house and public meeting on July 10, 2007. Since the refuge itself does not have meeting or conference facilities, the scoping meeting was held at Ocmulgee Mounds National Monument in Macon. Twenty-one members of the public attended the open house and scoping meeting. Attendees were able to mingle at leisure with refuge staff and look at exhibits and maps on hand. The public was able to express its concerns about the refuge and ideas and suggestions for its future management in writing on a comment form that was distributed for attendees and other interested parties. Written comments could either be submitted right at the meeting, mailed subsequently, or sent via email. A total of 521 comment forms and letters were received during the 30 day public scoping period.

The planning team identified a number of issues, concerns, and opportunities related to fish and wildlife protection, habitat restoration, recreation, and management of threatened and endangered species. 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 public scoping meetings, open planning team meetings, comment packets, and personal contacts. 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 considered all issues that were raised throughout the planning process, and has developed a CCP 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 identified during the scoping process can be found in Appendix D.

The notice of availability for a 30-day public review of the Bond Swamp NWR Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified of the upcoming public review period. The Draft CCP/EA was available for review from paper copy, compact disk, could be downloaded from the Internet. A total of 61 individuals submitted comments in writing. Appendix L summarizes all the comments that were received on the Draft CCP/EA for Bond Swamp NWR. Public comments on the Draft CCP/EA were accepted from June 22 to July 24, 2009.

### **Wilderness Review**

Refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. The results of the wilderness review are included in Appendix H.

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## *IV. Management Direction*

### **INTRODUCTION**

The Service manages fish and wildlife habitats considering 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 Improvement Act 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 above-mentioned Act identified hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation as priority wildlife-dependent public uses of the Refuge System. Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation are therefore emphasized in this plan.

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

Three alternatives for managing the refuge were considered in the draft comprehensive conservation plan and environmental assessment: Alternative A – Current Management (No Action); Alternative B – Custodial Management; and Alternative C – Enhanced Biological/Visitor Services Programs. Each of the alternatives was described in the Alternatives section of the Environmental Assessment. The Service chose Alternative C as the preferred management direction.

Implementing the preferred alternative will result in the conservation, protection, and enhancement of native habitats and wildlife populations representative of the Ocmulgee River floodplain and the Altamaha Watershed ecosystem. It would also furnish the public with quality wildlife-dependent recreation, environmental education, and interpretation that lead to greater understanding and enjoyment of fish, wildlife, and their habitats.

### **VISION**

Bond Swamp NWR was established on October 16, 1989 through cooperative efforts of the Service and The Nature Conservancy to protect, maintain, and enhance the ecosystem of the Ocmulgee River floodplain. Its intent was also development, advancement, management, conservation, and protection of fish and wildlife resources; the conservation of wetlands to maintain public benefits; and the conservation of wetlands to help fulfill international obligations of various migratory bird treaties and conventions.

Public use opportunities on Bond Swamp NWR have been limited, primarily because Piedmont NWR cannot devote the staff and resources necessary to safely and effectively support them. For several years, the refuge was closed to all public use with the exception of certain refuge sanctioned activities (e.g., guided canoe trips). The first true public use on Bond Swamp NWR occurred in 1999 as a result of the refuge's commitments to the Ocmulgee Heritage Greenway project. Several gravel parking lots, three information kiosks, and three hiking trails were built. In this year, the refuge held its first public deer hunt, and in 2000, hiking and fishing opportunities were made available.

In the next 15 years, the refuge will focus on increasing staff and expanding partnerships to address wildlife and habitat management and improve public use. The refuge will survey and inventory plants and wildlife to establish baseline information and develop plans that will establish

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management direction, including a Forest Management Plan, a Fire Management Plan, a Feral Hog Management Plan, a Cultural Resources Management Plan, a Visitor Services Plan, and an Integrated Pest Management Plan.

Partnerships and funding will be pursued to increase acquisitions within the refuge boundary. Public access will be improved for the east side of the refuge, and the west side of the refuge will be opened to public use. Hunting will be expanded to include small game, turkey, and waterfowl hunts. A boat ramp, canoe trail, and additional hiking trails will be provided. Environmental education and interpretation programs will be improved and expanded.

The Vision Statement developed for Bond Swamp NWR is:

“Bond Swamp National Wildlife Refuge is an oasis in middle Georgia, providing a unique opportunity for conservation and management of forested wetlands in the Ocmulgee River floodplain, associated uplands, and the wildlife that depends on these habitats. This unique opportunity creates a gateway for visitors to experience wildlife in their varied habitats, to foster a deeper understanding of the connections within a diverse ecosystem, and to appreciate the rich cultural heritage of the area.”

## **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 Improvement Act, the mission of the Refuge System, and the purposes and vision of Bond Swamp NWR. The Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

### *FISH AND WILDLIFE POPULATION MANAGEMENT*

Goal: Protect and manage threatened and endangered species, migratory birds, and species of concern, while conserving and managing the diversity, abundance, and ecological role of native fish and wildlife species.

*Discussion:* The waters, wetlands, uplands, and dense bottomland forests of Bond Swamp NWR attract and sustain populations of freshwater and anadromous fish, migratory waterfowl, neotropical migratory birds, and forest wildlife, including a wide variety of plants and animals associated with bottomland hardwood habitats. In addition, the refuge provides an actual or prospective home for certain plants and animals that are listed by the Service as threatened or endangered. Prominent birds and mammals, such as the bald eagle, wood stork, and black bear, are found on the refuge, as are many less conspicuous vertebrates and invertebrates.

Objective: Wintering Waterfowl – Increase contribution to the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan by adding 1,000 acres of winter flooded bottomland forest habitat through acquisition.

*Discussion:* The Bond Swamp NWR area supports one of the most significant concentrations of wintering waterfowl in middle Georgia. However, the refuge proper has had no water management capacity, and the provision of waterfowl habitat is essentially governed by rainfall and natural flooding events.

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Principal management considerations and potential roles of Bond Swamp NWR in support of various planning initiatives, such as the North American Waterfowl Management Plan, require effective coordination with such partners as the Atlantic Coast Joint Venture. North American Waterfowl Management Plan objectives for Bond Swamp NWR include developing waterfowl winter population and/or foraging habitat objectives in support of Atlantic Coast Joint Venture goals; and providing foraging habitat for wintering waterfowl through protection of "natural" flooding regimes. Coordination and participation with this Joint Venture can help refuge staff develop bird conservation priorities and objectives that are relevant and contribute to the efforts of partnerships operating at larger spatial scales.

*Strategies:*

- Prior to establishing desired habitat conditions and habitat management and restoration plans, continue promoting conservation and management of migratory birds.
- Continue to ensure disturbance-free foraging habitats for wintering waterfowl.

Objective: Winter Waterfowl Inventory – Reinstatement mid-winter waterfowl survey in cooperation with Georgia DNR.

*Discussion:* Though the flooded swamps of the Ocmulgee River and vicinity are difficult to survey accurately, and surveys are no longer flown, recent estimates indicate peak midwinter waterfowl use at 3,000-5,000 birds. Winter waterfowl inventories need to be reinstated to obtain more accurate population estimates.

*Strategy:*

- Conduct monthly aerial waterfowl surveys (Nov.-Feb.) for freshwater marsh and forested wetland habitats.

Objective: Wood Duck Banding – Band 50 wood ducks annually between July 1 and September 20.

*Discussion:* Resident wood ducks occur throughout the aquatic habitats in Bond Swamp NWR. Migrants add to this number during fall and winter. The greater Bond Swamp NWR area provides wintering habitat for several thousand ducks. The area contains outstanding wood duck habitat, and unknown numbers of wood ducks remain or return to the refuge to breed.

*Strategies:*

- Become familiar with and follow the handbook entitled "Increasing Wood Duck Productivity-Guidelines for Management and Banding for USFWS Refuge Lands (Southeast Region)" - Updated in 2003 by the Division of Migratory Birds.
- Band 50 wood ducks annually between July 1 and September 20.

Objective: Waterfowl Habitat Enhancement – Within 5 years of the date of this CCP, identify sites within Atlantic Coast Joint Venture focus areas conducive to waterfowl habitat enhancement and feasible types of manipulation.

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*Discussion:* Most of the priority conservation and management considerations for birds at Bond Swamp NWR involve promoting and maintaining proper conditions in forested uplands and bottomlands. Although the refuge is not in a flyway, it does hold a large number of ducks relative to middle Georgia. Wood ducks are the most common species and the refuge provides ideal nesting habitat for the resident birds. Mallards, gadwall, American wigeon, teal, and ring-necked ducks are common species found in the late fall and winter months. Management practices that enhance the production of a variety of mast species (including willow and water oaks) will benefit wood ducks and mallards. A lack of suitable nest cavities is one of the main limiting factors on wood duck populations. Over-mature and decadent trees usually contain the largest number of suitable cavities. Management that increases the number of suitable cavity trees, preferably within 100 yards of water, will improve habitat conditions for wood ducks on the refuge.

*Strategies:*

- Forest management in refuge bottomlands should favor the retention of suitable or potentially suitable cavity trees for wood ducks.
- As appropriate, consult with other refuges and experts with experience in enhancing waterfowl habitat.
- Promote development of oaks and other small mast producing species.

Objective: Forest-dependent Landbirds – For the duration of the CCP, within the context of forest planning, consider priority landbirds (e.g., species of concern from Partners-in-Flight) when implementing silvicultural treatments.

*Discussion:* Bond Swamp NWR and surrounding areas provide habitat for over 200 species of breeding and non-breeding birds. A number of these species, especially landbirds, is transient that utilize the refuge for only brief periods, such as during spring or fall migration. However, the majority will rely on the refuge for considerably longer periods, spending the entire breeding or non-breeding season, or even their entire annual cycle on the refuge. Important refuge habitats and resources for birds include bottomland hardwood forests, more permanently inundated forested wetlands (e.g., sloughs and beaver ponds), and pine/mixed pine uplands. The refuge and surrounding lands form one of the largest remaining blocks of bottomland forest/forested wetlands in Georgia, and their conservation is critical to the many species of landbirds that require large, relatively unfragmented forest systems to successfully breed and survive.

The suitability of these habitats for supporting such species is not only a function of the integrity of large forest tracts, but is also dependent on composition and structural characteristics. Heterogeneity in forest age, structure, and composition is important in providing the full complement of resources and characteristics necessary to support a diversity of bottomland forest bird species. Lack of mid- and under-story structure reduces the suitability of wooded tracts for species, such as Swainson's warblers, that rely on structural complexity in these strata for foraging, nesting, and escape cover. Analogously, extensive patchiness in the forest overstory can reduce suitability for canopy dwelling species. Compositional diversity in the overstory and understory is important, too, as it provides the greatest potential in terms of foraging substrates, plant foods, and nest sites. Thus, the principal considerations in forest conservation and management for bottomland birds on Bond Swamp NWR relate to promoting sufficient structural diversity, while maintaining the overall integrity and compositional diversity of the forest matrix.

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In upland habitats, structure, and diversity are similarly important, though in pine-dominated situations, maintenance of a relatively open-canopy and well-developed understory (i.e., grass and herbaceous layer) becomes increasingly important. Forest management and prescribed burning could enhance the ability of pine and mixed pine-hardwood uplands to support priority landbirds, such as Northern bobwhite, southeastern American kestrel, Bachman's sparrow, brown-headed nuthatch, and chuck-will's-widow.

Through its conservation assessment process, Partners-in-Flight has identified numerous landbird priorities for the Piedmont. Priority landbirds found at Bond Swamp NWR, and that the refuge can contribute meaningfully to the conservation of, include Swainson's warbler, wood thrush, yellow-billed cuckoo, and chuck-will's-widow. With the exception of chuck-will's-widow, all of these species are associated with hardwood forests, especially bottomlands. The relatively intact bottomland forest systems of Bond Swamp NWR should require limited active management to continue providing the full spectrum of benefits to priority landbirds.

*Strategies:*

- Pending data from forest inventories and subsequent establishment of desired future conditions, implement habitat management and restoration on bottomland and upland forests for the benefit of migratory birds and to support goals of Partners-in-Flight, the Northern Bobwhite Conservation Initiative, and other bird initiatives.
- Provide, manage, and restore, where possible, bottomland forest, forested wetland, and oak-pine upland habitats in support of breeding and wintering priority landbirds identified by Partners-in-Flight.
- Investigate the use of prescribed burning of pine habitats to remove excessive hardwood midstory, to encourage more mature stands with herbaceous/grassy ground cover, and to promote longleaf pine where appropriate for northern bobwhite, chuck-will's-widow, brown-headed nuthatch, and possibly Bachman's sparrow.
- Determine the need for and implement silvicultural treatments in bottomland forests to promote and maintain structural diversity to support species, such as Swainson's warbler, Kentucky warbler and American redstart.
- Before silvicultural objectives for bird conservation can be developed for bottomlands on Bond Swamp NWR, a thorough survey of forest conditions should be conducted. If such a survey indicates that structural complexity is lacking throughout significant bottomland areas of the refuge, then develop silvicultural objectives with the intention of improving bird habitats.
- Improve vegetative structural complexity in bottomland areas that are otherwise uniform and lacking in strata development.
- Opportunistically encourage soft mast producing trees and shrubs on upland and bottomland habitats.

*Discussion:* There are no known nesting rookeries on the refuge; however, isolated beaver ponds and adjacent forests provide exceptional foraging habitat and rookery sites for herons, egrets, ibis, and anhingas. Sandhill cranes would find potential feeding and roosting habitats in the wetlands.

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*Strategies:*

- Any rookeries should be protected from disturbance and management efforts that might impact their integrity.
- Locate nesting sites for colonial waterbird species each year and determine if special measures are needed to reduce disturbance.
- Provide natural structures in active rookeries.
- Give special consideration to protection and/or management of more permanently flooded areas as waterbird foraging habitat.

Objective: Amphibians and Reptiles – Within 10 years of the date of this CCP, conduct baseline surveys, using a variety of techniques. Conduct alligator survey in conjunction with the state.

*Discussion:* No reptile or amphibian species of special concern (excluding the American alligator, federally listed as threatened due to similarity of appearance) are known to occur in either the lowlands or uplands of Bond Swamp NWR; however, several are of possible occurrence. The bottomland hardwood habitats appear quite suitable for the southern dusky salamander, a species thought to be in steep decline for unapparent reasons. Also possible in this habitat and within floodplain ponds is the spotted turtle (state listed as unusual). This species is vulnerable to over-collection for the illegal pet trade, but may be affected by habitat disturbance as well. Four-toed salamanders, probably more cryptic than truly rare, may occur here as well. Within flowing waters, both rainbow snakes and dwarf waterdogs may be found. Rainbow snakes probably face few threats in areas like Bond Swamp NWR that are unaffected by downstream dams that may impede the migration of their primary prey, American eels. Like spotted turtles, dwarf waterdogs are probably more cryptic than rare. The unusual rock outcroppings and surrounding forests in Bond Swamp NWR uplands may possibly harbor coal skinks, a species with a very poorly known or highly fragmented range. Non-existent today, but possibly occurring in the past, is the state-threatened gopher tortoise. There exists some potential for reintroduction of this species to uplands at Bond Swamp NWR, provided that suitable habitats (open canopied pine and pine-hardwood) are restored.

*Strategies:*

- To determine occurrence and relative abundance on the refuge, conduct baseline herpetofaunal surveys, using drift fences, turtle traps, funnel traps, aural frog surveys, pedestrian surveys, and other techniques.
- Conduct dedicated pedestrian surveys specifically for southern dusky salamanders and, if found, estimate population or catch per unit effort to serve as a baseline for future population monitoring.
- No active habitat management is currently necessary to benefit herpetofauna in bottomland and wetland habitats. If conducted, future forest management activities in bottomlands should minimize compaction and alterations to important herpetofaunal habitat (e.g., downed woody debris and ephemeral drainages).
- Cooperate with Georgia DNR to conduct annual surveys for alligators on the refuge.



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Objective: Black Bear Survey – Within 5 years of the date of this CCP, cooperate with Georgia DNR to conduct annual surveys of black bears on the refuge, contributing to knowledge of central Georgia bear population.

*Discussion:* Populations of black bears occur in the north Georgia mountains and upper piedmont, in central Georgia below Macon along the Ocmulgee River, and in southeast Georgia in the vicinity of the Okefenokee Swamp. In recent years, black bear populations have increased in number and in the extent of the area in which they occur, particularly the north and central Georgia populations. An ongoing study on the Ocmulgee Wildlife Management Area, just south of Bond Swamp NWR, provides a preliminary estimate of 1.67 bears per-square-mile for that area. Researchers estimate the Bond Swamp NWR population at 1 bear per-square-mile. Though bears range widely in search of food, as development pressures increase around Macon and Warner Robins, Bond Swamp NWR will become increasingly important in sustaining the middle Georgia population. Habitat management strategies that favor a mature bottomland hardwood system with interspersed gaps will provide the variety of hard and soft mast utilized by bears. In the mature forest, large diameter trees with cavities are important as dens and cover, as are thickly vegetated areas resulting from large tree falls. Mature hardwood and mixed pine hardwood uplands also are an important mast resource for bears. Prescribed fire in suitable upland habitats stimulates soft mast production and improves conditions for small mammal prey species important to bears.

*Strategies:*

- Cooperate with Georgia DNR to conduct annual surveys of black bears on the refuge.
- Consult authorities on black bear management, including the Georgia DNR Wildlife Management Section's black bear management strategies.
- Support the conservation of one of three populations of black bear occurring in the state.

Objective: Bat Survey – Within 5 years of the date of this CCP, document the diversity and relative occurrence of bats through use of proper inventory and survey methods.

*Discussion:* Several common species of bats occur on the refuge, including southeastern myotis, eastern red, and eastern pipistrelle. There are other bat species that are likely to occur on the refuge.

*Strategies:*

- Diversity and relative occurrence of bats should be documented through use of proper inventory and survey methods.
- Documented occurrence of rare or sensitive species should be followed by their appropriate consideration in refuge management activities.
- Mist-netting or listening device surveys could help in locating presence of certain bat species.

Objective: Species of Concern (listed, candidate, federal, state, plant, animal) – Within 5 years of the date of this CCP, and on a regular basis subsequently, conduct periodic targeted surveys for listed species of plants and animals in cooperation with partners.

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*Discussion:* There are two possible occurrences on the refuge of plant species listed as federally endangered. These are the fringed campion (*Silene polypetala*) – endangered; and the relict trillium (*Trillium reliquum*) – endangered. Both of these species are also on the protected plant list of Georgia along with five additional species listed as occurring in Bibb and Twiggs Counties: yellow flytrap (*Sarracenia flava*) – unusual; ovate catchfly (*Silene ovata*) – rare; sweet pitcher-plant (*Sarracenia rubra*) – threatened; Indian olive (*Nestronia umbellula*) – threatened; and the Ocmulgee scullcap (*Scutellaria ocmulgee*) – threatened and a federal candidate.

Two federally listed animal species occur in the area: wood stork (*Mycteria Americana*) and shortnose sturgeon (*Acipenser brevirostrum*). Post-breeding wood storks frequent the refuge and the shortnose sturgeon occurs in the Ocmulgee system. The bald eagle (*Haliaeetus leucocephalus*), which was delisted in June 2007, is still protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. One active bald eagle nest is located on the refuge and is one of 112 in the State of Georgia. In addition to a year-round resident pair of eagles, during the winter months eagles may temporarily use the refuge as they pass through the region.

A state listed endangered fish that occurs in the Ocmulgee River is the robust redhorse sucker (*Moxostoma robustum*). This fish lives in Georgia rivers and was once thought to have disappeared from the Ocmulgee entirely. However, it was rediscovered in the river near Bond Swamp NWR in 1999. The state threatened Altamaha shiner (*Cyprinella xaenura*), the state rare goldstripe darter (*Etheostoma parvipinne*), and the spotted turtle (*Clemys guttata*) are listed as occurring in Bibb and Twiggs Counties, but it is unknown whether these are found on the refuge. The Altamaha spiny mussel (*Elliptio spinosa*) is a federal candidate that has potential to be found on the refuge. The Altamaha arc mussel (*Alasmidonta arcula*) is listed as threatened by the State of Georgia and is also likely to be found in the area, assuming appropriate habitat exists.

*Strategies:*

- Contract with the state natural heritage programs, universities, private consultants, and others to survey and classify unique habitats and any species occupying them on the refuge.
- Conduct inventories for rare plants, mussels, fish, and herpetofauna in cooperation with partners and promote protection, management, and restoration of habitats that support them.
- Ensure observance of appropriate disturbance buffers (e.g., bald eagle management guidelines) around bald eagle nests on the refuge.
- Continue participation in annual bald eagle monitoring program.
- Consider potential for reintroduction of gopher tortoise in upland areas that can be restored to more open pine and pine-oak mixes with abundant herbaceous cover.
- Minimize disturbance around areas frequented by post-breeding Wood Storks.

Objective: Invasive Animal Species – Implement feral hog management plan within 1 year of the date of this CCP, resulting in increased hog harvest.

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*Discussion:* Feral hogs occur in many of the bottomland hardwood habitats throughout Georgia, including Bond Swamp NWR. They are an exotic invasive species that can cause extensive damage to a variety of habitats. Feral hogs consume items from across the food web, including hard and soft mast, roots and other vegetation, invertebrates, amphibians, reptiles, bird eggs and young, small mammals, the young of larger mammals, agricultural crops, and carrion. Feeding activity by feral hogs turns over and uproots the forest floor, causing damage to seedlings, herbaceous and other sensitive plant communities, litter development, and soil structure. Feral hogs directly compete with other wildlife through removal of large amounts of a variety of food items. In addition, through direct consumption and habitat disruption, they can lead to unsustainable levels of mortality to a number of amphibian species.

*Strategies:*

- To the extent possible, feral hogs should be controlled on or eradicated from the refuge, and the refuge should remain vigilant to attempts by the public to release or otherwise sustain hog populations in the area. Additional control methods, such as trapping and sharpshooting, may become necessary if normal hunting activities fail to keep feral hog numbers at levels that cause minimal ecological damage.
- Implement the refuge hog control plan.
- Increase hunting pressure by the combination of deer and feral hog archery hunts and feral hog-only archery and muzzleloader hunts.
- Continue as much as possible the practice of incidental take of feral hogs by Service personnel during performance of routine duties.
- Explore the possibility of issuing special use permits for one or more local parties willing to trap feral hogs on the refuge.
- Partner with other agencies and cooperate with neighbors to find and implement the most effective means of reducing and permanently controlling the feral hog population.

#### *HABITAT MANAGEMENT*

Goal: Restore and maintain bottomland forests, upland forests, and wetland habitats for associated wildlife species.

*Discussion:* Bond Swamp NWR habitats are dominated by forested wetlands (bottomland hardwood and swamp), followed by upland forests (mixed hardwood and pine), and open water (streams, rivers, and beaver ponds). Two principal climax communities are expected on the refuge: southern mixed forest, and oak-hickory-pine forest. Other minor habitats (rock outcrops and clearings) are also important in contributing plant and wildlife diversity to the overall refuge landscape. All of these habitats support diverse fauna, among them neotropical migratory birds, waterfowl, black bear, and threatened and endangered species.

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Objective: Forest Management – Within 10 years of the date of this CCP, define the Desired Future Condition(s) for habitats of Bond Swamp NWR, and develop a forest management plan including appropriate forest inventory and silvicultural treatments deemed necessary for attaining desired future conditions and improving forest habitats for migratory birds, threatened/endangered species, and other trust resources.

*Discussion:* A forest management plan currently does not exist for Bond Swamp NWR. Any future management and conservation actions on the refuge will hinge upon the development of such a plan, and the desired future conditions, management strategies, and specific actions it identifies for achieving refuge habitat and wildlife objectives. The LMVJV, Forest Resource Conservation Working Group, has invested considerably in developing and justifying a set of desired forest conditions for bottomland hardwoods in the Mississippi Alluvial Valley. Given regional similarities in the composition, structure and function of bottomland systems, and consistencies in the habitat characteristics required by certain priority wildlife that inhabit bottomland forests, the information developed by this group represents an extremely relevant product for refuge staff to consider. Data collected from inventories of current conditions on Bond Swamp NWR could be cross-walked against the Lower Mississippi Valley information to see if management might be warranted to achieve those conditions.

Although the ACJV is still early in the process of deriving habitat goals to support bird population objectives, this and similar efforts by joint venture partners establish a perspective for considering desired future conditions and the conservation role of Bond Swamp NWR. The habitat needs of threatened, endangered, rare, candidate, and other "listed" species (at federal and state scales) can also be important considerations that refine expressions of desired future conditions. Species recovery plans address habitat needs, often in explicit detail. While listed species are of obvious concern when contemplating desired conditions, managers must be careful to balance any detailed ecological requirements of these species with broader ecosystem considerations and the needs of a variety of other wildlife and trust resources.

*Strategies:*

- Define the Desired Future Condition(s) for habitats of Bond Swamp NWR. Information developed for bottomland systems of the LMVJV will be particularly helpful. Utilize additional information such as Joint Venture implementation plans, bird initiative plans, threatened and endangered species recovery plans, USDA Forest Service forest type definitions, etc., to aid in developing empirical descriptions of habitat structure, dynamics, and other characteristics that best represent the appropriate ecological role of the refuge at various scales.
- Determine the appropriate roles for active versus more passive approaches to forest habitat management in sustaining ecological integrity and promoting desired future conditions.
- Develop a forest management plan to include appropriate forest inventory and silvicultural treatments deemed necessary for attaining desired future conditions and improving forest habitats for migratory birds, threatened/endangered species, and other trust resources.
- Acquire and analyze the biological data necessary to develop and administer a forest habitat management program.

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- Plan and implement cost effective forest inventory over the entire refuge. Utilize a Continuous Forest Inventory approach to periodically assess changes in the forest.
  - Design an achievable forest management strategy, using routine and innovative practices to attain the objectives. Incorporate all silvicultural tools, including fire, mechanical and chemical treatments, and any other innovative but practical efforts to achieve desired future condition(s).
  - Contribute to region-wide goals for longleaf pine community restoration through consideration and implementation of activities for improving/restoring pine and pine-hardwood uplands.
  - Conserve and promote the unique diversity found among rock outcroppings.

Objective: Fire Management – Develop new Fire Management Plan within 10 years of the date of this CCP that would allow for prescribed fire for habitat improvement.

*Discussion:* Maintaining or re-introducing prescribed fire to upland habitats would move these systems towards more ecologically appropriate fire frequency; understory species composition; and age, stature, density, and composition of the overstory.

Given the limited upland acreage of Bond Swamp NWR, the logistical and physical constraints of completing a burn, and the acknowledgement that many upland acres need not be considered for regular burning, it is likely that any burning of refuge uplands can proceed in a somewhat opportunistic manner and still provide desirable results. This might be fine from the standpoint of helping keep fuels and hardwood encroachment in check, thereby facilitating future management. Nonetheless, upland restoration and management activities should still be approached with a clear definition of desired future conditions. Therefore, such conditions would be defined for upland habitats to provide a basis for prioritizing management effort and for assessing management effectiveness, whether performed for bird conservation, fuel reduction, or general ecosystem restoration.

In addition to burning, desired reductions in mid-story hardwoods may also be accelerated through sparing use of mechanical means (e.g., mowing and chopping). Though less desirable than fire, these may be cost-effective solutions when burning is not an option, or to periodically enhance the hardwood reduction effects of prescribed burns. Soil disturbance and compaction in such operations are potential drawbacks, and should be minimized so as to avoid conditions favored by less desirable native and exotic herbs and grasses.

The more that prescribed burns and mechanical treatments promote a grassy-herbaceous understory, the more likely they are to provide conditions suitable for the priority upland species. If fire can eventually be reintroduced as a regular management tool on Bond Swamp NWR, patchiness of the burn is preferred over cleanliness. Larger burns should promote diversity and patchiness in the burn pattern, while smaller burns are likely to be more homogeneous in the degree and extent of vegetative effects. Patchiness will help ensure that hardwood and shrub components important to a number of bird and wildlife species are not entirely excluded from the landscape.

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*Strategies:*

- Develop a fire management plan to reduce hazardous fuels, and to restore, rehabilitate, and maintain fire-adapted ecosystems consistent with desired future conditions. Complete a plan that allows prescribed fire use. Ensure plan is in compliance with Federal Wildland Fire Policy.
- Treat hazardous fuels, using appropriate tools, to reduce the risk of unplanned and unwanted wildland fire to communities and to the environment.
- Assess risk to communities and resources from wildland fires originating on Service lands.
- Develop Memoranda of Understanding with state and other cooperators to assist with fire suppression or prescribed burning operations.

Objective: Open Water/Wetlands – Within 10 years of the date of this CCP, inventory and identify potential sites for establishment of greentree reservoirs for benefit of wintering waterfowl.

*Discussion:* Approximately 200 acres at Bond Swamp NWR consist of open water, including the Ocmulgee River, long sections of several important tributaries (Stone and Tobesofkee Creeks), and beaver ponds. The refuge also includes other minor drainages, and low swampy areas that remain "wet" for much of the year. Seasonal flooding (primarily October-March) of many acres of riverine bottomland forests still occurs with regularity. Typically, the refuge floods 5-6 times a year with flood events lasting from a couple of days to 2-3 weeks. Although the river will return to normal levels quickly, the swamp often holds flood waters for several weeks afterward.

A greentree reservoir is a forested lowland that is temporarily flooded during fall and winter to attract ducks, mainly mallards and wood ducks. It is designed to hold water while trees are dormant, which prevents permanent tree damage and possible death.

*Strategies:*

- Inventory and identify potential sites for establishment of greentree reservoirs.
- Promote development of more permanently flooded areas (e.g., sloughs and beaver ponds).

Objective: Controlling Invasive Plant Species – Within 5 years of the date of this CCP, prepare an Integrated Pest Management (IPM) Plan, which would identify, inventory, prioritize, and suggest appropriate control methods.

*Discussion:* The major problem plant species on Bond Swamp NWR are privet, Nepalese browntop (*Microstegium vimineum*), and non-native wisterias (*Wisteria sinensis* and *W. floribunda*). Other exotic invasive plants of concern include kudzu (*Pueraria montana*), Chinese tallow (*Sapium sebiferum*), Chinaberry (*Melia azedarach*), and mimosa or silk tree (*Albizia julibrissin*). Most of the exotics seem to be coming in on roadbeds. These and other exotic species can jeopardize the integrity of refuge habitats, directly affect wildlife, and impede or complicate future management attempts unless they can be monitored and combated.

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*Strategies:*

- Monitor, record, and map significant infestations of invasive plant species.
- Prepare an Integrated Pest Management Plan.
- Develop control/eradication plans for each species.
- Work with the NPS-led Invasive Species Task Force.
- Use public education and outreach methods to publicize impacts of nonnative and native pest species upon refuge resources.

**Objective:** Clearings and Rights-of-way – Collaborate with the Georgia Power Company to maintain open habitats within rights-of-way for benefit of butterflies and certain bird species (e.g., indigo buntings and blue grosbeaks). Consider opening forest canopy beside some road segments in refuge road system to increase understory structure.

*Discussion:* The Georgia Power Company maintains 120 acres of utility rights-of-way that traverse the refuge, primarily with the interest of protecting utility infrastructure. Many of these acres present excellent opportunities to promote management for open, successional habitats consistent with utility maintenance.

The low, grassy and herbaceous utility rights-of-way corridors are beneficial for butterflies, providing some of the only extensively open habitats on the refuge. When establishing vegetation in these areas, warm season grass mixes should be promoted in addition to diverse wildflower and herbaceous mixes. Solid stands of lespedeza and continuous ground covers of fescue should be avoided. Where possible, the boundary between open rights-of-way and adjacent forest should be "softened" by allowing the development of low-stature woody vegetation and brambles that provide a natural transition to forest. Such areas could greatly improve the potential of rights-of-way for shrub-loving birds, as well as produce soft mast to support birds during non-breeding periods. Rather than allowing woody vegetation to extend into rights-of-way, and potentially conflict with utility interests, a narrow margin of the existing tree line (on refuge property) could be cut and allowed to succeed into shrubs and low trees. These areas would need to be periodically maintained to retain the desired successional condition.

*Strategies:*

- Work with the Georgia Power Company and its contractor to promote compatible wildlife and habitat management on rights-of-way.
- Develop butterfly/native plant area in open space at top of mountain at Brown's Mount.

## **RESOURCE PROTECTION**

**Goal:** Protect cultural resources, provide adequate law enforcement, address environmental contamination and hydrological function, and continue to acquire lands within the approved acquisition boundary.

*Discussion:* Of primary concern is water quality on the refuge and the Ocmulgee River. In general, pollutants in the area are generated as byproducts of industrial production and a concentrated population center. The middle Georgia region has a rich archaeological and historical heritage.

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Small cultural sites on the refuge need to be protected from vandalism. Acquiring in-holdings would be beneficial for refuge operations by providing contiguous management control over the forested wetlands and reducing the complexity of hunting-related law enforcement in the area.

*Strategy:*

- Within 5 years of the date of this CCP, all refuge law enforcement officers will have taken the Archaeological Resources Protection Act training course.

**Objective:** Cultural Resources – Continue to comply with Section 106 of the National Historic Preservation Act and cooperate with the Muscogee Creek Nation in management and protection of Traditional Cultural Properties (TCPs). Within 10 years of the date of this CCP, implement a Phase I cultural resources survey of the refuge and within 15 years of the date of this CCP, develop and begin to implement an Integrated Cultural Resources Management Plan.

*Discussion:* The area in which the refuge is located has abundant cultural resources and a rich history. Bond Swamp NWR follows standard National Historic Preservation Act Section 106 procedures to protect the public's interest in preserving the cultural and historic legacy that may potentially occur on the refuge. Whenever construction work is undertaken that involves any excavation with heavy earthmoving equipment, such as tractors, graders and bulldozers, the refuge contracts with a qualified archaeologist or cultural resources expert to conduct an archaeological survey of the subject property. The results of this survey are submitted to the Service's Regional Historic Preservation Officer and the State Historic Preservation Office (SHPO). 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 National Register of Historic Places will be affected. If cultural resources are actually encountered during construction activities, the refuge is to notify the SHPO immediately. To date, no tracts on the refuge have been determined to be eligible for the National Register of Historic Places.

*Strategies:*

- Complete a Request for Cultural Resource Review Form, which will then be submitted to the Regional Archaeologist. The Regional Archaeologist will determine, in consultation with the refuge, the appropriate steps necessary for compliance. This strategy ensures that archaeological and cultural values have been described, identified, and taken into consideration prior to implementing undertakings.
- Within 5 years of the date of this CCP, pertinent refuge staff will have taken the Overview for Cultural Resources Management Requirements Course (WLD 2117) offered at NCTC.
- In consultation with the Regional Archaeologist, integrate cultural resources management and protection strategies into refuge management plans, such as Forest Habitat Management Prescriptions, the Fire Management Plan, and Road Maintenance Plan.



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- Integrate the GIS layer for the archaeological and historic sites in the refuge with existing and developing layers for habitat type, vegetative cover, hydrology, and soils. This layer will be a modified and streamlined version since the locations of archaeological sites are confidential as per Section 470w-3.a of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection Act. Information about the location, character, or ownership of any historic property under the Service's jurisdiction is not subject to Freedom of Information Act requests.
  - Within 5 years of the date of this CCP, a Cultural Resource Overview of the refuge will be completed. The Cultural Resource Overview facilitates the development of a step-down plan for surveying lands to identify archaeological resources. It and the subsequent Phase I archaeological survey will serve as a foundation for the refuge's Cultural Resources Management Plan.
  - Conduct a Phase I archaeological survey of the non-flooded areas of the refuge by qualified personnel, as a necessary first step in cultural resources management. The Regional Archaeologist, in cooperation with refuge staff, will develop a scope of work for a comprehensive archaeological survey and geomorphic investigations of the refuge, a government cost estimate, and ranking factors for contractor selection.
  - Conduct Phase II investigations of archaeological resources identified during the Phase I survey. Such investigations determine the eligibility of an identified resource for listing on the National Register of Historic Places.
  - Conduct a Phase III data recovery if the resources identified in Phases I and II are determined to be eligible and potential adverse effects cannot be avoided or minimized.
  - Prepare a Cultural Resources Management Plan for the refuge.
  - Follow procedures outlined in Cultural Resources Management Plan for consultation with the Service's Regional Historic Preservation Office, the State Historic Preservation Office, and potentially interested American Indian tribes.
  - Follow existing regional protocols for the inadvertent discoveries of human remains.
  - Work with local Native American, African American, and other communities to develop an education program and interpretive displays or panels regarding their cultural heritage and history, as well as the historical significance of refuge lands to the public.

**Objective:** Law enforcement – Add 1 full-time law enforcement officer for Bond Swamp NWR, working 2,080 hours per year dedicated to the refuge in boundary work, public safety, cultural resources identification, and protection. Continue to share 1 full-time law enforcement officer with Piedmont NWR, with approximately 700 hours annually dedicated to Bond Swamp NWR for patrols, trespass and cultural resources enforcement, and hunting/fishing compliance checks.

**Discussion:** Law enforcement for Bond Swamp NWR is provided by one full-time officer and one collateral-duty refuge officer located at Piedmont NWR. The refuge officers receive good cooperation from Georgia DNR officers and local police. The refuge officers spend approximately 25 percent of

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their time at Bond Swamp NWR, patrolling and conducting law enforcement work. The typical areas of concern include trespass, trash/refuse dumping, compliance with hunting regulations, vandalism, arson wildfires, and wildlife disturbance.

*Strategies:*

- Obtain funding to add 1 full-time law enforcement officer for Bond Swamp NWR.
- Continue to cooperate with law enforcement authorities in Bibb and Twiggs Counties on preventing and solving crime within and adjacent to the refuge boundary.
- Work closely with state game wardens during hunting and fishing seasons.

Objective: Environmental Contamination – For the duration of this CCP, closely cooperate with state and local government agencies and non-governmental organizations to characterize status of refuge waters and fish species with regard to presence and levels of toxins. Post fish consumption advisories as appropriate.

*Discussion:* The Ocmulgee River from Macon to downstream of Bond Swamp NWR is on the 2002 EPA 303(d) list of impaired waters for the presence of poly-chlorinated biphenyls (PCBs). The draft 2006 303(d) list also includes the impairments of fecal coliform and low dissolved oxygen, likely caused by urban runoff. Tobesofkee Creek is also listed for fecal coliform and low dissolved oxygen. Another significant threat to water quality is mercury. Plant Scherer has been identified as the largest emitter of mercury in Georgia. Plant Scherer's burning of coal accounts for 40 percent of the state's emissions, and roughly a third of this falls within 90 miles of the source. Bond Swamp NWR is located approximately 30 miles from Plant Scherer. Mercury contamination would negatively affect the refuge's aquatic resources.

*Strategies:*

- Cooperate with partners to conduct surveys for water quality and contaminants in refuge waters and fish species.
- At primary parking areas and boat launch, post health advisories related to consuming fish.

Objective: Hydrological Function – Continue to provide input to Ecological Services-Athens office on Section 404 permit applications. Improve communication with Ecological Services-Athens to provide more effective input and safeguard the refuge's interests.

*Discussion:* Several reservoirs and accompanying utility interests along drainages upstream from Bond Swamp NWR have led to altered hydrologic dynamics at the refuge. Such deviations from more natural hydrologic regimes are readily discernable, but their effects on natural systems at Bond Swamp NWR remain poorly understood. The extent and frequency at which "natural" flooding occurs at Bond Swamp NWR is in large part affected by hydropower operations at Lake Jackson, upstream along the Ocmulgee River. Other than influencing outflows from upstream dams and utilities, there is no capacity to manage water levels or areas subject to inundation.

Since 2001, the state has been operating under an interim policy regarding instream flows. This policy provides three options for withdrawal permit applicants to maintain instream flow: a) the lowest 7-day running average of a stream flow occurring once in 10 years (7Q10), b) a site-specific instream flow study,

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or c) a mean annual flow. The latter has different meaning depending on whether withdrawal is directly from the stream or from a reservoir. Presently, the Ocmulgee River is managed under the first listed option, using a 7Q10 value of 400 cfs. This policy does not specify timing of discharges, which means that winter flooding of Bond Swamp NWR's bottomland systems could be jeopardized.

As of 2007, 31 municipalities and industries had been permitted to withdraw a total of roughly 2,500 cfs (more than 4 times the current 7Q10 value) from the Ocmulgee River and its tributaries. All permittees are located upstream of Bond Swamp NWR. Many of the permitted water withdrawals will likely return to the river in the form of treated sewage or releases from electric power facilities. It is unknown how much these returns alter the historic hydrologic regime as a whole.

*Strategies:*

- Work with the Regional Water Rights Manager, Division of Ecological Services, appropriate state agencies, and other partners to develop a site-specific instream flow study.
- Work with partners to ensure that minimum instream flows are set that protect refuge resources and that permit winter floods to continue to inundate portions of the refuge.
- Actively participate in watershed management issues that establish appropriate hydrologic regimes, minimum flows, nutrient loads, etc., to ensure the integrity of wetland and bottomland communities.

**Objective:** Land acquisition – Pursue partnerships and funding to obtain a North American Wetland Conservation Act grant through the ACJV to increase acquisition within refuge boundary.

*Discussion:* Acquisition priorities and tracts of interest to the refuge include several small tracts of forested wetlands along the Ocmulgee River at the end of Bondsview Road. These tracts total less than 50 acres. Another includes a 275-acre tract at the end of Reid's Station Road along the Ocmulgee River. This site was recently clearcut by the landowner, and after a recent land survey was found that the cutting extended onto refuge property. Acquiring these in-holdings would be beneficial for refuge operations by providing contiguous management control over the forested wetlands and reducing the complexity of hunting-related law enforcement in the area. Finally, Florida Brick Company owns a 100-acre inholding of forested wetlands and open water pits west of the Ocmulgee River. This tract is actively mined for clay every 2 to 3 years. It would be desirable for the same reasons listed above and also because the open water areas provide habitat for wintering waterfowl, as well as excellent locations for wildlife observation and recreational fishing.

*Strategies:*

- Work with partners to acquire priority tracts.
- Identify areas where highest priority corridors for migratory birds and large mammals are located and should be acquired.

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## VISITOR SERVICES

Goal: Provide and enhance opportunities for hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation, and other compatible public uses.

*Discussion:* Public use opportunities on Bond Swamp NWR have been limited, primarily because Piedmont NWR cannot devote the staff and resources necessary to safely and effectively support them. In addition, there are no refuge maintained roads, so any access would have to be by foot, or the often poorly maintained county roads on the refuge's periphery. There is limited portable boat access on portions of Stone Creek. The Ocmulgee River is accessible by boat from public boat ramps above and below the refuge.

For several years, the refuge was closed to all public use with the exception of certain refuge sanctioned activities (e.g., guided canoe trips). The first true public use on Bond Swamp NWR occurred in 1999, as a result of the refuge's commitments to the Ocmulgee Heritage Greenway project. In this year, the refuge held its first public deer hunt, and in 2000, hiking and fishing opportunities were made available. Public use has averaged approximately 8,000-10,000 visitors annually.

Objective: Visitor Services Plan – Within 3 years of the date of this CCP, prepare and begin to implement a Visitor Services Plan to provide overall management guidance for public use on the refuge.

*Discussion:* The refuge will develop a step-down Visitor Services Plan. Descriptions of specific materials, signs, exhibits and displays, and themes to promote the six priority public uses adopted by the Service will be addressed in this step-down management plan. It will address specific visitor service activities and specific services the refuge could provide local communities, as well as cooperative partnerships to increase awareness of fish and wildlife resources and systematically improve visitor experiences within the area.

Issues related to refuge management will be addressed in the step-down plan. Current and future staffing needs to implement the recommendations within the plan will also be addressed. The plan will include budgetary needs and current databases such as RONS and SAMMS and will explore opportunities for funding and partnerships to help the refuge accomplish the recommendations within the plan. The plan will include a system for monitoring and evaluating the effectiveness of the visitor services program annually. The plan should be comprehensive, covering all aspects of visitor services program in detail.

### *Strategies:*

- Develop a visitor services step down plan that will provide strategies, timelines, and measurable outcomes to accomplish the goals and objectives of the CCP.
- Include in the step down plan strategies for making refuge visitor services programs and activities universally accessible.

Objective: Visitor Welcome and Orientation – Work with state and county partners to improve directional signage, kiosks, parking lots, and maintenance.

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*Discussion:* There are no directional signs to Bond Swamp NWR on I-16 or on Highway 23, nor any entry signs at the major entry points onto the refuge. There are signs at the turn into the Stone Creek parking area and the Longleaf Pine Trail parking area, as well as signs at the primary parking areas that provide information about the refuge. The boundary is well-signed in some areas, but in other areas the boundary signs are missing or faded.

Maintenance for the parking areas, hunter access trails, and kiosks is provided by staff from Piedmont NWR. The staff mows the hunter access trails before the start of hunting season. There are no refuge maintained roads on Bond Swamp NWR; however, there are many hunter access trails that are not well-maintained except for mowing at the start of hunting season. There are two large gravel parking areas on the refuge, both adjacent to Highway 23. There is also a parking area at Brown's Mount. The refuge has developed a plan to improve the two parking areas adjacent to Highway 23.

There are three 6-panel kiosks on the refuge. Each is located at one of the three main parking areas (Stone Creek, Longleaf Pine, and Brown's Mount).

*Strategies:*

- Place directional signs at the decision points on all trails (i.e., east side of inner loop of Beaver Swamp Trail).
- On Highway 23, place early warning signs (with recreational symbols) before the turns into Stone Creek and Longleaf Trail parking areas.
- Make sure that the boundary is adequately posted, including replacing faded boundary signs.
- Work with the state to place signs on I-16, directing travelers to the refuge.
- At all main entry points into the refuge, install the standard "permitted/prohibited" signs (i.e., Reid's Station Road, Alfred Bond Drive, Bondsvue Road, Stone Creek parking area, Longleaf parking area, Griffin Road Access, and two other access points on west side).
- Make sure all "no hunting" zones are well posted.
- Provide spaces for handicap parking in all designated parking areas.
- In larger parking areas (Brown's Mount, Stone Creek, and Longleaf) use concrete or cross-tie bumpers to better define parking spaces.
- Continue to work with the county to complete improvements on Bondsvue Road.
- When rehabbing the existing kiosks, change the panel configuration from an X to a double U.

*Objective:* Access – Within the 15-year life of this CCP, improve access on east side by working with the Georgia Department of Transportation and Federal Highway Administration's Federal Lands Highway Division to install turning lanes at entrances, improve Stone Creek Road, and provide boat and canoe/kayak access to Stone Creek. Open vehicular access on west side by locating right-of-way. Work with Georgia DNR to locate boat ramp along the Ocmulgee River.

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*Discussion:* Hunting access is limited to county dirt roads and woods roads open to foot travel only along the perimeter of Bond Swamp NWR. Traversing the hunt area is by foot only, and no ATV traffic is allowed. Access to the waters in Bond Swamp NWR requires walking through wooded areas in most cases. There is limited portable boat access to Stone Creek from the Stone Creek parking area and off Reid's Station Road. The Stone Creek parking access has been identified for improvements through construction funding. Bondsview Road has been identified by Georgia DNR for placement of a boat ramp on refuge property. This ramp, when constructed, will allow much more fishing access via boat. The west side of the refuge is not currently open to public use. Portions of Bond Swamp NWR on the west side of the Ocmulgee River have not been assessed for public use opportunities.

*Strategies:*

- Continue to work with state/county to install turn lanes on Highway 23.
- Open access on the west side for Griffin Road, develop parking, and improve Subdivision Road.
- Partner with Georgia DNR to install a boat ramp on Bondsview Road.
- Develop canoe launch site at Stone Creek parking area.
- When boundary issues are settled, develop a canoe take out site on Reid's Station Road.

Objective: Hunting – Within 5 years of settlement of a lawsuit against the Service now being litigated, maintain or expand existing hunts and add small game, wild turkey, and waterfowl hunts. Open west side of refuge to hunting once access is provided.

*Discussion:* Hunting on the refuge is allowed during a limited time each fall and winter. Hunting regulations are provided in a 4-fold brochure that is also used as the required refuge permit for all hunting and fishing. Refuge regulations generally follow state guidelines. According to harvest data, all current hunts are quality hunts, with good participation. Hunters must sign in at the beginning of each hunt, and must check game out at the check station each day. Currently, the refuge has a 3-week archery hunt for deer and feral hogs. Two gun hunts for feral hogs only occur from December to February for a total of approximately 30 days. Only permitted hunters are allowed on the refuge during gun hunts. Hunting access is limited to county dirt roads and foot paths along the perimeter of Bond Swamp NWR. White-tailed deer and feral hogs are the only animals legal to take at this time. Changes to the refuge hunting program cannot be considered, pending the outcome of a current law suite. At a future date, changes will be considered through amending the refuge hunt plan and associated environmental assessment.

*Strategies:*

- Update Hunt Plan annually.
- Open access on the west side of Griffin Road, develop parking, and improve access on the Subdivision Road.
- Open the west side to the same hunting opportunities as on the east side.

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- Eliminate hog quota hunt and make it an open hunt, but continue to monitor numbers and reinstate quota if needed.
  - Work with biologist to determine the maximum number of hog hunt days.
  - Allow small game hunting.
  - Explore opportunities for waterfowl hunting.
  - Develop hunter sign-in kiosks at the main entry points to the refuge.
  - Maintain quality and safety in all public hunting activities.

**Objective: Fishing** – Within 3-5 years of the date of this CCP, increase fishing opportunities through increased access on the east and west sides; at primary parking areas and boat launch, and post health advisories related to consuming fish. Work with Georgia DNR to consider methods for controlling flathead catfish.

*Discussion:* The east side of Bond Swamp NWR is open to fishing from March 15-October 15. The refuge offers good fishing opportunities on both the Ocmulgee River and Stone Creek. Fishing and non-quota hunting permits and regulations are printed on a 4-fold brochure. State regulations apply for creel limits except largemouth bass must be 14 inches in length to keep. Commercial use is not allowed. Access to the waters in Bond Swamp NWR requires walking through wooded areas in most cases. There is limited portable boat access to Stone Creek from the Stone Creek parking area and off Reid's Station Road. Bondsview Road or Reid's Station Road has been identified by the Georgia DNR for placement of a boat ramp on refuge property. This ramp, when constructed, will allow much more fishing access via boat. The portions of Bond Swamp NWR on the west side of the Ocmulgee River have not been assessed for fishing opportunities.

*Strategies:*

- At primary parking areas and boat launch, post health advisories related to consuming fish.
- At Stone Creek parking area and boat ramp, provide monofilament recycling container with information about why it is important to recycle monofilament.
- Partner with Georgia DNR to install a boat ramp on Bondsview Road.
- Develop canoe launch site at Stone Creek parking area.
- When the boundary issue is settled, develop a canoe take out site on Reid's Station Road.
- Open the west side of the refuge to fishing when opened to public.
- Develop an updated Fishing Plan as appropriate.

**Objective: Wildlife Observation and Photography** – Within 10 years of the date of this CCP, develop canoe trail on Stone Creek, improve the viewshed at the Brown's Mount overlook, and develop a boardwalk along Stone Creek.

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*Discussion:* Observable wildlife on the refuge includes white-tailed deer, feral hogs, black bears, raccoons, and several rodent species. There are numerous bird species sought by birders, including the prothonotary warbler, hooded warbler, Swainson's warbler, and waterfowl. There are no observation or photography blinds located on the refuge.

There are two designated hiking trails, Beaver Swamp Trail and Longleaf Pine Trail, located on Bond Swamp NWR. The Beaver Swamp Trail consists of a figure eight, with one loop measuring 0.9-mile and the other measuring 1.3 miles. This trail is located in the Stone Creek bottom lands and often floods and can be impassable at times. The Longleaf Pine Trail is 1.9 miles and is located in the upland area of the refuge. The elevation of this trail is high enough to allow year-round use, free of flooding. The only access to Stone Creek for wildlife observation is via the Beaver Swamp Trail. Limited portable boat access is available on Stone Creek from the Stone Creek parking area and Reid's Station Road. There is also no designated boat access for the Ocmulgee River. There are numerous foot trails used primarily by hunters that can also be used for wildlife observation; however, these trails are not indicated on general refuge maps.

There are numerous trails located on Brown's Mount that provide wildlife viewing opportunities; one leading to an overlook. Until an archaeological survey has been completed, this area will remain closed to the public.

*Strategies:*

- Develop a canoe trail on Stone Creek.
- Develop a boardwalk along Stone Creek.
- Develop a wildlife observation trail on Bondsview Road when road improvements are completed.
- Partner with local birding groups to improve observation opportunities.
- Explore the possibility of developing hiking access across Stone Creek near or above the beaver dam area.
- Maintain the trail and improve the viewshed at Brown's Mount.
- Work with partners and volunteers to remove exotic plants from Brown's Mount.
- Provide access via Griffin Road on the west side.
- Develop the powerline access road as a "birding" trail, and develop a hiking trail off the powerline access road.

Objective: Environmental/Cultural Resources Education and Interpretation – In cooperation with partners, develop, and implement an educational program that provides an understanding and appreciation of the refuge's ecology and historic and present human influence on the region's ecosystems. Add 1 full-time park ranger.



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*Discussion:* Bond Swamp NWR does not have an established environmental education program. Bond Swamp NWR information is covered in some of the Piedmont NWR programs. Due to the lack of staff, there is virtually no staff directed interpretation on the refuge, and the refuge staff has seen a general trend of decline for program requests. Brown's Mount has been used by a local museum for environmental education programs; however, due to constraints, the museum has stopped doing programs at the site. The Service has recently completed an agreement with the State of Georgia for the management of Brown's Mount. The property at Brown's Mount has visitor facilities, including a restroom and pavilion area. The trails on the 170-acre property wind through a beautiful mixed hardwood stand, and lead up to a scenic mountain top.

There is no visitor center dedicated exclusively to Bond Swamp NWR. The visitor center located at the Piedmont NWR headquarters has one sign board dedicated to Bond Swamp NWR. It shows the refuge map, describes the importance of the refuge, and identifies some of the common wildlife by sight and sound that can be found on the refuge.

There are four brochures for the refuge, including a general refuge brochure; bird checklist; amphibians, fish, mammals, and reptiles list; and hunting and fishing regulations. All brochures are current and up to Service standards. There is also a web site managed for Bond Swamp NWR that is connected with the web site for Piedmont NWR. There are interpretive panels located at Stone Creek, Longleaf Pine, and Brown's Mount parking lots.

*Strategies:*

- Look for a good partner to provide environmental education at Brown's Mount – develop clear, specific memorandums of understanding.
- Obtain funding to hire a staff person for Bond Swamp NWR who will focus on environmental education.
- Work with a conservation partner to put a small office/trailer at Brown's Mount for the refuge staff person to be located there.
- Develop interpretive panels at Beaver Swamp Trail, Longleaf Trail, Bondsvie or Reid's Station Roads (boat launch and/or new trail), and Brown's Mount Trail.
- Possible themes include:
  - History of the Area
  - Geology/Hydrology
  - Mixed Hardwood Forest
  - Migratory Birds/Neotropical Birds
  - Waterfowl
  - Exotic Plants and Animals
  - Service/Refuge System
  - Ecological Restoration
  - Hunting as a Management Tool

Objective: Outreach – Identify potential outreach events (i.e., Buck-a-rama) and decide which events provide the greatest return on investment and limit participation to those events only. As time allows, arrange for talks at local groups (civic, library, garden clubs, schools, etc.).

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*Discussion:* Due to the lack of staff on Bond Swamp NWR, there is little outreach occurring. Refuge staff sets up booths at local events, such as the Buck-a-rama, where they provide information and brochures regarding Bond Swamp NWR to the public. There are currently no special events held on the Bond Swamp NWR. News releases regarding refuge happenings, such as hunt openings, are sent to the local news outlets by refuge staff. There are occasional stories printed in local papers regarding the wildlife and nature of the refuge.

*Strategies:*

- Continue to provide news releases as appropriate.
- Identify potential outreach events (i.e., Buck-a-rama) and decide which events provide the greatest return on investment and limit participation to those events only.
- Develop one annual special event to be held at Brown's Mount (i.e., National Wildlife Refuge Week event).
- Maintain good relationships with local congressional offices
- Develop a table top exhibit specific to Bond Swamp NWR.
- Consider joining the local chamber of commerce.
- Participate in off-refuge activities that benefit the watershed – Ocmulgee Heritage Greenway efforts, NRCS, FSA, Partners for Fish and Wildlife, and other state and federal programs that promote water, soil, and wildlife conservation.

## *REFUGE ADMINISTRATION*

**Goal:** Provide adequate staff, partners, volunteers, facilities and equipment to support the goals and objectives of the refuge in a safe manner.

*Discussion:* Implementation of this CCP will depend on adequate resources (e.g., funding, staff, equipment, facilities, and infrastructure) to follow through on objectives and strategies. At the present time, Bond Swamp NWR is being administered under Piedmont NWR, approximately 30 miles to the north. No facilities or equipment are currently located at Bond Swamp NWR, making it logistically more difficult for on-site work to be accomplished. The refuge has 1 full-time employee, a refuge operations specialist, and no annual budget.

**Objective:** Staffing – Reinstate refuge operations specialist and park ranger; add law enforcement officer, forestry technician, and engineering equipment operator.

*Discussion:* As originally intended, Bond Swamp NWR was to be staffed and operated as an independent refuge. However, since its inception, lack of an operational budget led to its being administered under Piedmont NWR. No facilities or equipment are currently located at Bond Swamp NWR, making it logistically more difficult for on-site work to be accomplished. The refuge has one full-time position, a refuge operations specialist, which is slated to be cut and no annual budget. Law enforcement for Bond Swamp NWR is provided by the one full-time and one collateral duty refuge officers who are located at Piedmont NWR and spends approximately 25 percent of their time at Bond Swamp NWR.

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*Strategies:*

- Secure funding to hire all necessary positions.
- Hire a park ranger to manage the visitor services, outreach, and volunteer programs.
- The law enforcement officer will supply full-time law enforcement function to the refuge, replacing the Piedmont NWR officer. The officer will be involved in providing security for refuge resources, visitors and staff, preventing and solving crimes, and enforcing hunting and fishing regulations on the refuge.
- The forestry technician will participate in forest and fire management activities.
- The engineering equipment operator will have a range of responsibilities, such as equipment maintenance, road maintenance, installation and maintenance of proposed boat launches and trails, and various habitat enhancement and restoration projects.

**Objective:** Partners and Volunteers – Continue to partner with Georgia DNR, Georgia Forestry Commission, and Muscogee Creek Nation on refuge and cultural management questions. Actively participate with local partnerships in resource conservation and land planning, such as Ocmulgee Heritage Greenway, and cooperate with conservation non-governmental organizations and other civic organizations.

*Discussion:* There is no volunteer program in place for Bond Swamp NWR due to the lack of on-site facilities and no staff dedicated to the refuge. There is no friends group for Bond Swamp NWR. With little cohesion among conservation groups in the local area, there is little interest in creating a group to support the refuge.

In 1999, Bond Swamp NWR became an official partner in the Ocmulgee Heritage Greenway project, a cooperative effort to protect the wetland systems of the Ocmulgee River through development of an integrated system of natural, scenic, and historical sites, affording diverse public education and recreational opportunities. In demonstration of its commitment to this project, Bond Swamp NWR entered into a memorandum of understanding with other private and public greenway partners, including the Trust for Public Land, city of Macon, Georgia DNR, Macon Water Authority, NPS, and Bibb County Board of Commissioners.

The refuge has partnered with the Georgia DNR on several efforts, including the Robust Redhorse Recovery Project; annual butterfly, wintering waterfowl, and bald eagle surveys; and neotropical migratory bird surveys. Georgia DNR continues to provide technical assistance with Swainson's warbler and cane monitoring and management.

Refuge staff cooperates with the public works departments, sheriff departments, and emergency services in Bibb and Twiggs Counties for joint assistance with law enforcement, road work, etc. Georgia DNR is also a law enforcement partner, assisting with hunts.

Approximately 1,072 acres are owned in fee title by the State of Georgia and managed by Bond Swamp NWR under cooperative agreement. These include Brown's Mount, and the McNair and Timberlake north tracts. Both the state and the refuge have essentially the same over-riding interests in these lands, and they need to develop the specifics of the 50-year management plan that implements the cooperative agreement.

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*Strategies:*

- Continue to partner with Georgia DNR, Georgia Forestry Commission, the Muscogee Creek Nation, and the Ocmulgee Heritage Greenway.
- As community interest and volunteer support increases, look for opportunity to support a friend's group for Bond Swamp.
- Projects/Activities that could be accomplished with volunteers include:
  - Developing and maintaining the Stone Creek Canoe Launch Area
  - Trail clean up at Brown's Mount
  - Staffing special event
  - Leading bird walks
  - Staffing the hunt check stations
  - Collecting biological data
- Continue developing relationship with Bass Pro.
- Explore opportunities to partner with organizations such as the boy scouts, girl scouts, 4-H clubs, etc.
- Develop a partnership to conduct education programs.

**Objective: Facilities and Equipment** – Within 15 years of the date of this CCP, plan and construct office and maintenance yard east of Highway 23. Acquire tractor, backhoe, five trucks, johnboat with motor, one four-wheeler, and trailer.

*Discussion:* No facilities or equipment are currently located at Bond Swamp NWR.

*Strategies:*

- Secure funding to construct facilities and obtain equipment.
- Construct office and maintenance yard east of Highway 23.
- Acquire equipment, including a tractor, backhoe, five trucks, a johnboat with motor, one four-wheeler, and a trailer.

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## V. Plan Implementation

### INTRODUCTION

Refuge lands are managed as defined under the Improvement Act. 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 wildlife-dependent 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 wildlife-dependent recreation and environmental education.

To accomplish the purpose, vision, goals, and objectives contained in this plan for Bond Swamp NWR, this section identifies projects, 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 fish and wildlife population management, habitat management, resource protection, visitor services, and refuge administration over the next 15 years. This proposed project list reflects the priority needs identified by the public, 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.

#### *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 inventorying 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, colonial nesting waterbirds, and forest-dependent landbirds, among others, and resident wildlife, including amphibians and reptiles, black bears, and bats. 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 other refuge programs. All data will be shared with appropriate state and federal partners in an effort to further ecosystem management. This project will reinstate the refuge operations specialist 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 \$70,000 per year.

##### **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

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analysis. This information is critical to formulating management actions and evaluating other refuge programs. These systems will also be useful for analyzing baseline data on contaminants from contributory watersheds and backwater flooding events. The estimated first-year cost for this project is \$20,000, with a recurring cost of \$2,000 per year.

### *HABITAT MANAGEMENT*

#### **Project 3: Forest Habitat Management**

An active forest management program is important to the restoration and maintenance of the bottomland forest, upland forest, and wetland habitats on the refuge. The development and implementation of a forest management plan is critical to creating spatially diverse forest to support source populations of migratory and resident wildlife. Included in this project is a forestry technician position to plan and implement forest management and inventory. The estimated first-year cost of this project is \$135,000, with a recurring cost of \$70,000 per year.

#### **Project 4: Heavy Equipment Package**

This project will complete essential rehabilitation and maintenance work on the refuge. It will include the hiring of one engineering equipment operator; replacement of numerous collapsed culverts; graveling of damaged sections of roads; purchases of essential heavy equipment to complete rehabilitation and development projects; and the removal of woody vegetation from road 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 a boom-axe with tractor (\$50,000); a truck and trailer (\$125,000); a backhoe (\$75,000); and a 100 hp tractor with bushhog mower and disk (\$100,000). The estimated first-year cost of this project is \$485,000, with an annual recurring cost of \$100,000.

#### **Project 5: 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 (IPM) to control invasive and nuisance plants and animals. Invasive plant occurrence will be mapped and quantified. Appropriate IPM strategies will be used to control privet, Nepalese browntop, non-native wisterias, kudzu, Chinese tallow, Chinaberry, and mimosa. Strategies will include chemical, mechanical, and biological control techniques. This project will add a tractor mounted, PTO driven spray rig (\$3,000). Being omnivores, feral swine utilize virtually every component of the habitat and directly compete with native wildlife, reducing their carrying capacity and adversely affecting their reproduction and recruitment. This project will include implementation of a feral hog control plan. The estimated cost is \$15,000, with a recurring cost of \$10,000 per year.

#### **Project 6: Fire Management Package**

Prescribed fire is an important tool in the management of refuge habitats. A fire management plan will be developed to reduce hazardous fuels, and to restore, rehabilitate, and maintain fire-adapted ecosystems consistent with desired future conditions. The estimated cost is \$20,000, with a recurring cost of \$10,000 per year.

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**Project 7: Open Water/Wetlands Management Package**

The refuge will be inventoried to assess potential sites for the establishment of green-tree reservoirs for shorebirds, wading birds, and waterfowl. Several water control structures will be needed to allow for handling of water. Surveying and levee construction will also be needed to ensure proper placement of structures and extent of flooded areas. An estimated cost for this project is \$25,000, with a recurring cost of \$1,000 per year for maintenance.

**RESOURCE PROTECTION****Project 8: Law Enforcement Package**

The refuge currently receives between 10,000 -12,000 visits annually and increased visitation is expected as the CCP is implemented. Bond Swamp NWR currently has no dedicated law enforcement officer, but is dependent on Piedmont NWR's one full-time and one collateral-duty refuge officer for all refuge law enforcement. The refuge officer will be responsible for boundary work, public safety, and cultural resource identification and protection, as well as trespass and hunting/fishing compliance checks. This project will add one full-time officer to the refuge, while continuing to share duties with the Piedmont NWR officers. The first-year cost of this project is \$135,000, with a recurring cost of \$100,000.

**Project 9: Boundary Lines Survey**

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 20 miles of boundary line at an estimated cost of \$5,000 per mile. The total cost of this project is \$100,000, with a recurring cost of \$3,000.

**Project 10: 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 sufficient interest in the remaining acres within the existing refuge boundary, south of Bondsvie Road, until such time as the fate of the highway extension north of Bondsvie Road is settled. 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 in-holdings 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, and cooperative efforts with various Service partners, including The Trust for Public Lands and The Nature Conservancy. The estimated cost of this project is \$4 – 6 million.

**Project 11: Archaeological Survey**

A phase I archaeological survey of Bond Swamp NWR 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 through preparation of an integrated cultural resources management plan. The estimated first-year cost of this project is \$123,000, with a recurring cost of \$3,000.

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## VISITOR SERVICES

### **Project 12:** Visitor Service Program Support Package

Currently, Bond Swamp NWR offers 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/cultural education and interpretation. 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 \$150,000, with a recurring cost of \$100,000.

### **Project 13:** Wildlife Observation Package

This project will include the construction of a boardwalk to incorporate wildlife observation and interpretation sites along Stone Creek. The site will include parking, maintained trails with boardwalks, foot bridges (when necessary), interpretive panels, and observation blinds or platforms. Informational brochures and interpretive panels will describe the area's natural and cultural resources, refuge management programs, and the Refuge System. The estimated cost of this project is \$283,000, with a recurring cost of \$13,000.

### **Project 14:** Roads Projects

The primary access roads on the west side of Bond Swamp NWR and within the interior of the refuge are constructed of dirt. These dirt roads are used on a daily basis to transport equipment and perform associated maintenance activities. The roads become impassable during wet weather and hinder refuge management and visitor use. Upgrading them will consist of shaping the road beds, adding culverts, and applying 6 inches of gravel. This project will 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 the public or very hard to access. The estimated first-year cost of this project is \$750,000, with a recurring cost of \$6,000.

### **Project 15:** Fishing Access Improvement Package

Fishing is a popular recreational activity on the refuge. However, inadequate public use facilities and access to fishing areas limit the public's opportunity to enjoy Stone Creek and the Ocmulgee River. This project will provide directional signs, an interpretive kiosk, accessible trails, a parking area, and boat launches on Stone Creek and the Ocmulgee River. Minimum public use standards will be met at this site. The estimated total cost for this project is \$40,000, with a recurring cost of \$8,000.

## REFUGE ADMINISTRATION

### **Project 16:** Equipment Replacement Package

Refuge operations, maintenance, visitor services, and law enforcement depend on reliable vehicles capable of travel both on- and off-road. The refuge uses a combination of trucks, ATVs, and boats for access. These vehicles are subjected to rough terrain and severe duty that effectively shorten their serviceable condition to less than 5 years. The refuge needs to replace, on average, at least



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one vehicle and an ATV every 3 years to maintain a safe and dependable vehicle fleet. The estimated cost of this project is \$202,000; five vehicles (\$150,000); an ATV (\$6,000); an outboard motor and boat (\$10,000); a bushhog mower (\$18,000); a disk (\$18,000). Recurring cost: \$36,000.

**Project 17: Construct Office/Shop and Fenced Compound on Bond Swamp NWR**

Currently, the refuge does not have an office/shop or fenced compound on Bond Swamp NWR. Equipment must be transported from Piedmont NWR, which is 30 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 an office/shop and fenced compound to maintain equipment and keep it safe. The estimated cost of this project is \$450,000, with a recurring cost of \$10,000.

**FUNDING AND PERSONNEL**

Table 3 below summarizes the projects described above, estimates first year and recurring annual costs, and lists new staff positions.

Bond Swamp NWR currently has a staff of one – the refuge operations specialist. However, staff at Piedmont NWR administers Bond Swamp NWR. This CCP recommends reinstating the refuge operations specialist and park ranger, adding a law enforcement officer, a forestry technician, and an engineering equipment operator.

**PARTNERSHIP/VOLUNTEERS OPPORTUNITIES**

A key element of this CCP is to establish partnerships with local volunteers, landowners, private organizations, and state and federal natural resource agencies. In the immediate vicinity of the refuge, opportunities exist to establish partnerships with the Muscogee Creek Nation, the Ocmulgee Heritage Greenway, the Norfolk Southern Railroad, the Georgia Power Company, and the Macon Museum of Arts and Sciences. At regional and state levels, partnerships may be established or enhanced with organizations such as Georgia DNR and other state and federal agencies.

**STEP-DOWN MANAGEMENT PLANS**

A CCP is a strategic plan that guides the direction of the refuge. A step-down management plan provides specific guidance on activities, such as habitat, fire, and visitor services. These plans (Table 4) are also developed in accordance with NEPA, which requires the identification and evaluation of alternatives and public review and involvement prior to their implementation.

**Table 3. Summary of projects**

PROJECT NUMBER	PROJECT TITLE	FIRST YEAR COST	RECURRING ANNUAL COST	STAFF (FTE'S)
1	Science-based inventory and monitoring of plant and animal populations	\$135,000	\$70,000	1
2	gis and spatial technology package	\$20,000	\$2,000	
3	forest habitat management	\$135,000	\$70,000	1
4	heavy equipment package	\$485,000	\$100,000	1
5	invasive and exotic species control	\$15,000	\$10,000	
6	fire management package	\$20,000	\$10,000	
7	Open water/wetlands management package	\$25,000	\$1,000	
8	Law Enforcement Package	\$135,000	\$100,000	1
9	boundary lines survey	\$100,000	\$3,000	
10	land protection within approved refuge boundary	\$4-6,000,000	**	
11	archeological survey	\$123,000	\$3,000	
12	visitor service program support package	\$150,000	\$100,000	1
13	wildlife observation package	\$283,000	\$13,000	
14	Roads package	\$750,000	\$6,000	
15	fishing access improvement package	\$40,000	\$8,000	
16	equipment Replacement package	\$202,000	\$36,000	
17	construct office/shop and fenced compound on Bond Swamp NWR	\$450,000	\$10,000	

**Table 4. Bond Swamp NWR step-down management plans related to the goals and objectives of the CCP**

Step-down Plan	Completion (or Revision) Date
Biological Inventory/Monitoring Plan	2016
Cultural Resources Management Plan	2024
Environmental/Cultural Education Plan	2010
Exotic Plant Control Plan	2012
Fire Management Plan	2019
Fishing Plan	Revise and update annually
Feral Hog Management Plan	2010
Forest Management Plan	2019
Hunting Plan	Revise and update annually
Integrated Pest Management Plan	2014
Law Enforcement Plan	Revise and update annually
Wildlife Observation and Photography Plan	2010
Visitor Services Plan	2012

**Biological Inventory/Monitoring Plan** (Develop), Draft Completion 2016: 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 (migratory birds including songbirds, neotropical migratory birds, and waterfowl); listed species (federal and state threatened, endangered and species of concern); and key resident species shall 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.

**Cultural Resources Management Plan** (Develop), Draft Completion 2024: This plan will describe cultural resources of the refuge and address means with which to preserve and protect these resources. It will outline proper procedures for notifying the Regional Archaeologist and State Historic Preservation Office.

**Fire Management Plan** (Develop), Draft Completion 2019: 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.

**Forest Management Plan** (Update), Draft Completion 2019: This plan will describe strategies for meeting refuge forest management objectives. It will include direction on stand improvement, harvest, and disease/forest pest outbreaks.

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**Integrated Pest Management Plan** (Develop and Update), Draft Completion 2014: 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.

- **Exotic 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.
- **Feral Hog Control Plan** (Develop), Draft Completion 2010: 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).

**Visitor Services Plan** (Develop), Draft Completion 2012: This plan will describe the refuge's wildlife-dependent recreation, and environmental education and interpretation. Specific issues or items that will be addressed include facility requirements, site plans, and disable accessibility. The environmental/cultural education, fishing, hunting, and sign plans will be sections of this plan.

- **Environmental/Cultural Education Plan** (Develop), Draft Completion 2010: This plan (as part of the Visitor Services Plan) will reflect the objectives and strategies of the CCP and address environmental education guidelines following Service standards.
- **Fishing Plan** (Update), Revise Annually: 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, accessibility for disabled, facilities needed, and refuge-specific regulations.
- **Hunting and Trapping Plan** (Update), Revise Annually: 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, accessibility for disabled, facilities needed, and refuge-specific hunting regulations.
- **Law Enforcement Plan** (Update), Revise Annually: This plan will provide a reference to station policies, procedures, priorities, and programs concerning law enforcement.
- **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.

## **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

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appropriate partner participation. If monitoring and evaluation indicate undesirable effects for target and non-target species and/or communities, then alterations to the management projects will be made. Subsequently, the CCP will be revised. Specific monitoring and evaluation activities will be described in the step-down management plans.

### **PLAN REVIEW AND REVISION**

This CCP will be reviewed annually as the refuge's annual work plans and budgets are developed. It will also be reviewed 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 CCP 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 CCP and step-down management plans will be subject to public review and NEPA compliance.



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## APPENDICES

### *Appendix A. Glossary*

- Adaptive Management:** Refers to a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in a management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
- Alluvial:** Sediment transported and deposited in a delta or riverbed by flowing water.
- Alternative:** 1. A reasonable way to fix the identified problem or satisfy the stated need (40 CFR 1500.2). 2. Alternatives are different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission, and resolving issues (Service Manual 602 FW 1.6B).
- Anadromous:** Migratory fishes that spend most of their lives in the sea and migrate to fresh water to breed.
- Biological Diversity:** The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1. 12B). The System's focus is on indigenous species, biotic communities, and ecological processes. Also referred to as biodiversity.
- Carrying Capacity:** The maximum population of a species able to be supported by a habitat or area.
- Categorical Exclusion:** A category of actions that does not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a federal agency pursuant to the National Environmental Policy Act (40 CFR 1508.4).
- CFR:** Code of Federal Regulations.
- Compatible Use:** A proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose(s) of the national wildlife refuge [50 CFR 25.12 (a)]. A compatibility determination supports the selection of compatible uses and identifies stipulations or limits necessary to ensure compatibility.

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<b>Comprehensive Conservation Plan:</b>	A document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge; helps fulfill the mission of the Refuge System; maintains and, where appropriate, restores the ecological integrity of each refuge and the Refuge System; helps achieve the goals of the National Wilderness Preservation System; and meets other mandates (Service Manual 602 FW 1.6 E).
<b>Concern:</b>	See Issue
<b>Cover Type:</b>	The present vegetation of an area.
<b>Cultural Resource Inventory:</b>	A professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).
<b>Cultural Resource Overview:</b>	A comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate information from a field office's background or literature search described in Section VIII of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).
<b>Cultural Resources:</b>	The remains of sites, structures, or objects used by people in the past.
<b>Designated Wilderness Area:</b>	An area designated by the U.S. Congress to be managed as part of the National Wilderness Preservation System (Draft Service Manual 610 FW 1.5).
<b>Disturbance:</b>	Significant alteration of habitat structure or composition. May be natural (e.g., fire) or human-caused events (e.g., aircraft overflight).
<b>Ecosystem:</b>	A dynamic and interrelating complex of plant and animal communities and their associated non-living environment.
<b>Ecosystem Management:</b>	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.



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<b>Endangered Species (Federal):</b>	A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
<b>Endangered Species (State):</b>	A plant or animal species in danger of becoming extinct or extirpated in the state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.
<b>Environmental Assessment (EA):</b>	A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).
<b>Environmental Impact Statement (EIS):</b>	A detailed written statement required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).
<b>Estuary:</b>	The wide lower course of a river into which the tides flow. The area where the tide meets a river current.
<b>Finding of No Significant Impact (FONSI):</b>	A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).
<b>Goal:</b>	Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (Service Manual 620 FW 1.6J).
<b>Habitat:</b>	Suite of existing environmental conditions required by an organism for survival and reproduction. The place where an organism typically lives.
<b>Habitat Restoration:</b>	Management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy ecosystems.
<b>Habitat Type:</b>	See Vegetation Type.
<b>Improvement Act:</b>	The National Wildlife Refuge System Improvement Act of 1997.
<b>Informed Consent:</b>	The grudging willingness of opponents to “go along” with a course of action that they actually oppose (Bleiker).

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<b>Issue:</b>	Any unsettled matter that requires a management decision [e.g., an initiative, opportunity, resource management problem, threat to the resources of the unit, conflict in uses, public concern, or other presence of an undesirable resource condition (Service Manual 602 FW 1.6K)].
<b>Management Alternative:</b>	See Alternative
<b>Management Concern:</b>	See Issue
<b>Management Opportunity:</b>	See Issue
<b>Migration:</b>	The seasonal movement from one area to another and back.
<b>Mission Statement:</b>	Succinct statement of the unit's purpose and reason for being.
<b>Monitoring:</b>	The process of collecting information to track changes of selected parameters over time.
<b>National Environmental Policy Act of 1969 (NEPA):</b>	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 NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (40 CFR 1500).
<b>National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57):</b>	Under the Refuge Improvement Act, the Fish and Wildlife Service is required to develop 15-year comprehensive conservation plans for all national wildlife refuges outside Alaska. The Act also describes the six public uses given priority status within the Refuge System (i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation).
<b>National Wildlife Refuge System Mission:</b>	The mission 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.
<b>National Wildlife Refuge System:</b>	Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; wildlife ranges; game ranges; wildlife management areas; or waterfowl production areas.

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<b>National Wildlife Refuge:</b>	A designated area of land, water, or an interest in land or water within the Refuge System.
<b>Native Species:</b>	Species that normally live and thrive in a particular ecosystem.
<b>Noxious Weed:</b>	A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive or difficult to manage; parasitic; a carrier or host of serious insect or disease; or non-native, new, or not common to the United States. According to the Federal Noxious Weed Act (P.L. 93-639), a noxious weed is one that causes disease or had adverse effects on man or his environment and therefore is detrimental to the agriculture and commerce of the United States and to the public health.
<b>Objective:</b>	A concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating the success of strategies, making objectives attainable, time-specific, and measurable (Service Manual 602 FW 1.6N).
<b>Plant Association:</b>	A classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.
<b>Plant Community:</b>	An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community.
<b>Preferred Alternative:</b>	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.
<b>Prescribed Fire:</b>	The application of fire to wildland fuels to achieve identified land use objectives (Service Manual 621 FW 1.7). May occur from natural ignition or intentional ignition.
<b>Priority Species:</b>	Fish and wildlife species that require protective measures and/or management guidelines to ensure their perpetuation. Priority species include the following: (1) State-listed and candidate species; (2) species or groups of animals susceptible to significant population declines within a specific area or statewide by virtue of their inclination to aggregate (e.g., seabird colonies); and (3) species of recreation, commercial, and/or tribal importance.
<b>Public Involvement Plan:</b>	Broad long-term guidance for involving the public in the comprehensive conservation planning process.

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<b>Public Involvement:</b>	A process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
<b>Public:</b>	Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in service issues and those who do or do not realize that Service decisions may affect them.
<b>Purposes of the Refuge:</b>	“The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge sub-unit.” For refuges that encompass congressionally designated wilderness, the purposes of the Wilderness Act are additional purposes of the refuge (Service Manual 602 FW 106 S).
<b>Recommended Wilderness:</b>	Areas studied and found suitable for wilderness designation by both the Director of the Fish and Wildlife Service and the Secretary of the Department of the Interior, and recommended for designation by the President to Congress. These areas await only legislative action by Congress in order to become part of the Wilderness System. Such areas are also referred to as “pending in Congress” (Draft Service Manual 610 FW 1.5).
<b>Record of Decision (ROD):</b>	A concise public record of decision prepared by the federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were not), and a summary of monitoring and enforcement where applicable for any mitigation (40 CFR 1505.2).
<b>Refuge Goal:</b>	See Goal
<b>Refuge Purposes:</b>	See Purposes of the Refuge
<b>Songbirds:</b> (Also Passerines)	A category of birds that is medium to small, perching landbirds. Most are territorial singers and migratory.
<b>Step-down Management Plan:</b>	A plan that provides specific guidance on management subjects (e.g., habitat, public use, fire, and safety) or groups of related subjects. It describes strategies and implementation schedules for meeting CCP goals and objectives (Service Manual 602 FW 1.6 U).

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<b>Strategy:</b>	A specific action, tool, technique, or combination of actions, tools, and techniques used to meet unit objectives (Service Manual 602 FW 1.6 U).
<b>Study Area:</b>	The area reviewed in detail for wildlife, habitat, and public use potential. For purposes of this CCP, the study area includes the lands within the currently approved refuge boundary and potential refuge expansion areas.
<b>Threatened Species (Federal):</b>	Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
<b>Threatened Species (State):</b>	A plant or animal species likely to become endangered in the state within the near future if factors contributing to population decline or habitat degradation or loss continue.
<b>Tiering:</b>	The coverage of general matters in broader environmental impact statements with subsequent narrower statements of environmental analysis, incorporating by reference, the general discussions and concentrating on specific issues (40 CFR 1508.28).
<b>U.S. Fish and Wildlife Service Mission:</b>	The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.
<b>Unit Objective:</b>	See Objective
<b>Vegetation Type, Habitat Type, Forest Cover Type:</b>	A land classification system based upon the concept of distinct plant associations.
<b>Vision Statement:</b>	A concise statement of what the planning unit should be, or what we hope to do, based primarily upon the Refuge System mission and specific refuge purposes, and other mandates. We will tie the vision statement for the refuge to the mission of the Refuge System; the purpose(s) of the refuge; the maintenance or restoration of the ecological integrity of each refuge and the Refuge System; and other mandates (Service Manual 602 FW 1.6 Z).

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**Wilderness Study Areas:**

Lands and waters identified through inventory as meeting the definition of wilderness and undergoing evaluation for recommendation for inclusion in the Wilderness System. A study area must meet the following criteria:

- Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
- Has outstanding opportunities for solitude or a primitive and unconfined type of recreation; and
- Has at least 5,000 contiguous roadless acres or is sufficient in size as to make practicable its preservation and use in an unimpaired condition (Draft Service Manual 610 FW 1.5).

**Wilderness:**

See Designated Wilderness

**Wildfire:**

A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (Service Manual 621 FW 1.7).

**Wildland Fire:**

Every wildland fire is either a wildfire or a prescribed fire (Service Manual 621 FW 1.3)

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## ACRONYMS AND ABBREVIATIONS

ACJV	Atlantic Coast Joint Venture
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
CWCS	Comprehensive Wildlife Conservation Strategy
DNR	Department of Natural Resources
DOT	Department of Transportation
EA	Environmental Assessment
EE	Environmental Education
EPA	U.S. Environmental Protection Agency
FHA	Federal Highway Administration
FTE	Full-time Equivalent
FWS	U.S. Fish and Wildlife Service (also Service)
GA	Georgia
GASPHS	Georgia State Parks and Historic Sites
GS	General Schedule
IPM	Integrated Pest Management
LE	Law Enforcement
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NGO	Non-government Organization
NWR	National Wildlife Refuge
RONs	Refuge Operating Needs System
ROW	Right-of-Way
SAMMS	Service Asset Maintenance Management System
SHPO	State Historic Preservation Office
SWG	State Wildlife Grant
TCP	Traditional Cultural Property
USC	United States Code
WG	Wage Grade
WRD	Wildlife Resources Division





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## *Appendix C. Relevant Legal Mandates and Executive Orders*

<b>STATUE</b>	<b>DESCRIPTION</b>
Administrative Procedures Act (1946)	Outlines administrative procedures to be followed by federal agencies with respect to identification of information to be made public; publication of material in the Federal Register; maintenance of records; attendance and notification requirements for specific meetings and hearings; issuance of licenses; and review of agency actions.
American Antiquities Act of 1906	Provides penalties for unauthorized collection, excavation, or destruction of historic or prehistoric ruins, monuments, or objects of antiquity on lands owned or controlled by the United States. The Act authorizes the President to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States.
American Indian Religious Freedom Act of 1978	Protects the inherent right of Native Americans to believe, express, and exercise their traditional religions, including access to important sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.
Americans With Disabilities Act of 1990	Intended to prevent discrimination of and make American society more accessible to people with disabilities. The Act requires reasonable accommodations to be made in employment, public services, public accommodations, and telecommunications for persons with disabilities.
Anadromous Fish Conservation Act of 1965, as amended	Authorizes the Secretaries of Interior and Commerce to enter into cooperative agreements with states and other non-federal interests for conservation, development, and enhancement of anadromous fish and contribute up to 50 percent as the federal share of the cost of carrying out such agreements. Reclamation construction programs for water resource projects needed solely for such fish are also authorized.
Archaeological Resources Protection Act of 1979, as amended.	This Act strengthens and expands the protective provisions of the Antiquities Act of 1906 regarding archaeological resources. It also revised the permitting process for archaeological research.
Architectural Barriers Act of 1968	Requires that buildings and facilities designed, constructed, or altered with federal funds, or leased by a federal agency, must comply with standards for physical accessibility.
Bald and Golden Eagle Protection Act of 1940, as amended	Prohibits the possession, sale or transport of any bald or golden eagle, alive or dead, or part, nest, or egg except as permitted by the Secretary of the Interior for scientific or exhibition purposes, or for the religious purposes of Indians.

STATUE	DESCRIPTION
Bankhead-Jones Farm Tenant Act of 1937	Directs the Secretary of Agriculture to develop a program of land conservation and utilization in order to correct maladjustments in land use and thus assist in such things as control of soil erosion, reforestation, conservation of natural resources and protection of fish and wildlife. Some early refuges and hatcheries were established under authority of this Act.
Cave Resources Protection Act of 1988	Established requirements for the management and protection of caves and their resources on federal lands, including allowing the land managing agencies to withhold the location of caves from the public, and requiring permits for any removal or collecting activities in caves on federal lands.
Clean Air Act of 1970	Regulates air emissions from area, stationary, and mobile sources. This Act and its amendments charge federal land managers with direct responsibility to protect the “air quality and related values” of land under their control. These values include fish, wildlife, and their habitats.
Clean Water Act of 1974, as amended	This Act and its amendments have as its objective the restoration and maintenance of the chemical, physical, and biological integrity of the Nation’s waters. Section 401 of the Act requires that federally permitted activities comply with the Clean Water Act standards, state water quality laws, and any other appropriate state laws. Section 404 charges the U.S. Army Corps of Engineers with regulating discharge of dredge or fill materials into waters of the United States, including wetlands.
Coastal Barrier Resources Act of 1982 (CBRA)	Identifies undeveloped coastal barriers along the Atlantic and Gulf Coasts and included them in the John H. Chafee Coastal Barrier Resources System (CBRS). The objectives of the act are to minimize loss of human life, reduce wasteful federal expenditures, and minimize the damage to natural resources by restricting most federal expenditures that encourage development within the CBRS.
Coastal Barrier Improvement Act of 1990	Reauthorized the Coastal Barrier Resources Act (CBRA), expanded the CBRS to include undeveloped coastal barriers along the Great Lakes and in the Caribbean, and established “Otherwise Protected Areas (OPAs).” The Service is responsible for maintaining official maps, consulting with federal agencies that propose spending federal funds within the CBRS and OPAs, and making recommendations to Congress about proposed boundary revisions.
Coastal Wetlands Planning, Protection, and Restoration (1990)	Authorizes the Director of the Fish and Wildlife Service to participate in the development of a Louisiana coastal wetlands restoration program, participate in the development and oversight of a coastal wetlands conservation program, and lead in the implementation and administration of a national coastal wetlands grant program.

STATUE	DESCRIPTION
Coastal Zone Management Act of 1972, as amended	Established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans and requires that “any federal activity within or outside of the coastal zone that affects any land or water use or natural resource of the coastal zone” shall be “consistent to the maximum extent practicable with the enforceable policies” of a state’s coastal zone management plan. The law includes an Enhancement Grants Program for protecting, restoring, or enhancing existing coastal wetlands or creating new coastal wetlands. It also established the National Estuarine Research Reserve System, guidelines for estuarine research, and financial assistance for land acquisition.
Emergency Wetlands Resources Act of 1986	This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act requires the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amounts equal to import duties on arms and ammunition. It also established entrance fees at national wildlife refuges.
Endangered Species Act of 1973, as amended	Provides for the conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging the establishment of state programs. It provides for the determination and listing of threatened and endangered species and the designation of critical habitats. Section 7 requires refuge managers to perform internal consultation before initiating projects that affect or may affect endangered species.
Environmental Education Act of 1990	This Act established the Office of Environmental Education within the U.S. Environmental Protection Agency to develop and administer a federal environmental education program in consultation with other federal natural resource management agencies, including the Fish and Wildlife Service.
Estuary Protection Act of 1968	Authorized the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory estuaries of the United States, including land and water of the Great Lakes, and to determine whether such areas should be acquired for protection. The Secretary is also required to encourage state and local governments to consider the importance of estuaries in their planning activities relative to federal natural resource grants. In approving any state grants for acquisition of estuaries, the Secretary was required to establish conditions to ensure the permanent protection of estuaries.

STATUE	DESCRIPTION
Estuaries and Clean Waters Act of 2000	This law creates a federal interagency council that includes the Director of the Fish and Wildlife Service, the Secretary of the Army for Civil Works, the Secretary of Agriculture, the Administrator of the Environmental Protection Agency and the Administrator for the National Oceanic and Atmospheric Administration. The council is charged with developing a national estuary habitat restoration strategy and providing grants to entities to restore and protect estuary habitat to promote the strategy.
Food Security Act of 1985, as amended (Farm Bill)	The Act contains several provisions that contribute to wetland conservation. The Swampbuster provisions state that farmers who convert wetlands for the purpose of planting after enactment of the law are ineligible for most farmer program subsidies. It also established the Wetland Reserve Program to restore and protect wetlands through easements and restoration of the functions and values of wetlands on such easement areas.
Farmland Protection Policy Act of 1981, as amended	The purpose of this law is to minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. Federal programs include construction projects and the management of federal lands.
Federal Advisory Committee Act (1972), as amended	Governs the establishment of and procedures for committees that provide advice to the federal government. Advisory committees may be established only if they will serve a necessary, non-duplicative function. Committees must be strictly advisory unless otherwise specified and meetings must be open to the public.
Federal Coal Leasing Amendment Act of 1976	Provided that nothing in the Mining Act, the Mineral Leasing Act, or the Mineral Leasing Act for Acquired Lands authorized mining coal on refuges.
Federal-Aid Highways Act of 1968	Established requirements for approval of federal highways through national wildlife refuges and other designated areas to preserve the natural beauty of such areas. The Secretary of Transportation is directed to consult with the Secretary of the Interior and other federal agencies before approving any program or project requiring the use of land under their jurisdiction.
Federal Noxious Weed Act of 1990, as amended	The Secretary of Agriculture was given the authority to designate plants as noxious weeds and to cooperate with other federal, State and local agencies, farmers' associations, and private individuals in measures to control, eradicate, prevent, or retard the spread of such weeds. The Act requires each Federal land-managing agency, including the Fish and Wildlife Service, to designate an office or person to coordinate a program to control such plants on the agency's land and implement cooperative agreements with the states, including integrated management systems to control undesirable plants.



STATUE	DESCRIPTION
Fish and Wildlife Act of 1956	Establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also includes the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife resources. Among other things, it authorizes the Secretary of the Interior to take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources including, but not limited to, research, development of existing facilities, and acquisition by purchase or exchange of land and water or interests therein.
Fish and Wildlife Conservation Act of 1980, as amended	Requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under the Endangered Species Act.
Fish and Wildlife Coordination Act of 1958	Promotes equal consideration and coordination of wildlife conservation with other water resource development programs by requiring consultation with the Fish and Wildlife Service and the state fish and wildlife agencies where the “waters of a stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified” by any agency under federal permit or license.
Improvement Act of 1978	This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary 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.
Fishery (Magnuson) Conservation and Management Act of 1976	Established Regional Fishery Management Councils comprised of federal and state officials, including the Fish and Wildlife Service. It provides for regulation of foreign fishing and vessel fishing permits.
Freedom of Information Act, 1966	Requires all federal agencies to make available to the public for inspection and copying administrative staff manuals and staff instructions; official, published and unpublished policy statements; final orders deciding case adjudication; and other documents. Special exemptions have been reserved for nine categories of privileged material. The Act requires the party seeking the information to pay reasonable search and duplication costs.
Geothermal Steam Act of 1970, as amended	Authorizes and governs the lease of geothermal steam and related resources on public lands. Section 15 c of the Act prohibits issuing geothermal leases on virtually all Service-administrative lands.

STATUE	DESCRIPTION
Lacey Act of 1900, as amended	Originally designed to help states protect their native game animals and to safeguard U.S. crop production from harmful foreign species, this Act prohibits interstate and international transport and commerce of fish, wildlife or plants taken in violation of domestic or foreign laws. It regulates the introduction to America of foreign species.
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 for 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.
Marine Mammal Protection Act of 1972, as amended	The 1972 Marine Mammal Protection Act established a federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otter, walrus, polar bear, dugong, and manatee. The Department of Commerce is responsible for cetaceans and pinnipeds, other than the walrus. With certain specified exceptions, the Act establishes a moratorium on the taking and importation of marine mammals, as well as products taken from them.
Migratory Bird Conservation Act of 1929	Established a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds. The role of the commission was expanded by the North American Wetland Conservation Act to include approving wetlands acquisition, restoration, and enhancement proposals recommended by the North American Wetlands Conservation Council.
Migratory Bird Hunting and Conservation Stamp Act of 1934	Also commonly referred to as the "Duck Stamp Act," requires waterfowl hunters 16 years of age or older to possess a valid federal hunting stamp. Receipts from the sale of the stamp are deposited into the Migratory Bird Conservation Fund for the acquisition of migratory bird refuges.
Migratory Bird Treaty Act of 1918, as amended	This Act implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Except as allowed by special regulations, this Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, barter, export or import any migratory bird, part, nest, egg, or product.
Mineral Leasing Act for Acquired Lands (1947), as amended	Authorizes and governs mineral leasing on acquired public lands.

STATUE	DESCRIPTION
Minerals Leasing Act of 1920, as amended	Authorizes and governs leasing of public lands for development of deposits of coal, oil, gas, and other hydrocarbons; sulphur; phosphate; potassium; and sodium. Section 185 of this title contains provisions relating to granting rights-of-way over federal lands for pipelines.
Mining Act of 1872, as amended	Authorizes and governs prospecting and mining for the so-called “hardrock” minerals (i.e., gold and silver) on public lands.
National and Community Service Act of 1990	Authorizes several programs to engage citizens of the U.S. in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Among other things, this law establishes the American Conservation and Youth Service Corps to engage young adults in approved human and natural resource projects, which will benefit the public or are carried out on federal or Indian lands.
National Environmental Policy Act of 1969	Requires analysis, public comment, and reporting for environmental impacts of federal actions. It stipulates the factors to be considered in environmental impact statements, and requires that federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unqualified environmental values are given appropriate consideration, along with economic and technical considerations.
National Historic Preservation Act of 1966, as amended	It establishes a National Register of Historic Places and a program of matching grants for preservation of significant historical features. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register.
National Trails System Act (1968), as amended	Established the National Trails System to protect the recreational, scenic, and historic values of some important trails. National recreation trails may be established by the Secretaries of Interior or Agriculture on land wholly or partly within their jurisdiction, with the consent of the involved state(s), and other land managing agencies, if any. National scenic and national historic trails may only be designated by Congress. Several national trails cross units of the National Wildlife Refuge System.
National Wildlife Refuge System Administration Act of 1966	Prior to 1966, there was no single federal law that governed the administration of the various national wildlife refuges that had been established. This 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(s) for which the refuge was established.

STATUE	DESCRIPTION
National Wildlife Refuge System Improvement Act of 1997	This Act amends the National Wildlife Refuge System Administration Act of 1966. This Act defines the mission of the National Wildlife Refuge System, establishes the legitimacy and appropriateness of six priority wildlife-dependent public uses, establishes a formal process for determining compatible uses of Refuge System lands, identifies the Secretary of the Interior as responsible for managing and protecting the Refuge System, and requires the development of a comprehensive conservation plan for all refuges outside of Alaska.
Native American Graves Protection and Repatriation Act of 1990	Requires federal agencies and museums to inventory, determine ownership of, and repatriate certain cultural items and human remains under their control or possession. The Act also addresses the repatriation of cultural items inadvertently discovered by construction activities on lands managed by the agency.
Neotropical Migratory Bird Conservation Act of 2000	Establishes a matching grant program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America, and the Caribbean.
North American Wetlands Conservation Act of 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 North American Wetlands Conservation Council was created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission. Available funds may be expended for up to 50 percent of the United States' share cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands).
Refuge Recreation Act of 1962, as amended	This Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife-dependent recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.
Partnerships for Wildlife Act of 1992	Establishes a Wildlife Conservation and Appreciation Fund to receive appropriated funds and donations from the National Fish and Wildlife Foundation and other private sources to assist the state fish and game agencies in carrying out their responsibilities for conservation of non-game species. The funding formula is no more than 1/3 federal funds, at least 1/3 foundation funds, and at least 1/3 state funds.

STATUE	DESCRIPTION
Refuge Revenue Sharing Act of 1935, as amended	Provided for payments to counties in lieu of taxes from areas administered by the Fish and Wildlife Service. Counties are required to pass payments along to other units of local government within the county, which suffer losses in tax revenues due to the establishment of Service areas.
Rehabilitation Act of 1973	Requires nondiscrimination in the employment practices of federal agencies of the executive branch and contractors. It also requires all federally assisted programs, services, and activities to be available to people with disabilities.
Rivers and Harbors Appropriations Act of 1899, as amended	Requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States. The Fish and Wildlife Coordination Act provides authority for the Service to review and comment on the effects on fish and wildlife activities proposed to be undertaken or permitted by the Corps of Engineers. Service concerns include contaminated sediments associated with dredge or fill projects in navigable waters.
Sikes Act (1960), as amended	Provides for the cooperation by the Departments of Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources and outdoor recreation facilities on military reservations throughout the United States. It requires the Secretary of each military department to use trained professionals to manage the wildlife and fishery resource under his jurisdiction, and requires that federal and state fish and wildlife agencies be given priority in management of fish and wildlife activities on military reservations.
Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948	This Act provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.
Transportation Equity Act for the 21st Century (1998)	Established the Refuge Roads Program, requires transportation planning that includes public involvement, and provides funding for approved public use roads and trails and associated parking lots, comfort stations, and bicycle/pedestrian facilities.
Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended	Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

STATUE	DESCRIPTION
Water Resources Planning Act of 1965	Established Water Resources Council to be composed of Cabinet representatives including the Secretary of the Interior. The Council reviews river basin plans with respect to agricultural, urban, energy, industrial, recreational and fish and wildlife needs. The act also established a grant program to assist States in participating in the development of related comprehensive water and land use plans.
Wild and Scenic Rivers Act of 1968, as amended	This Act selects certain rivers of the nation possessing remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values; preserves them in a free-flowing condition; and protects their local environments.
Wilderness Act of 1964, as amended	This Act directs the Secretary of the Interior to review every roadless area of 5,000 acres or more and every roadless island regardless of size within the National Wildlife Refuge System and to recommend suitability of each such area. The Act permits certain activities within designated wilderness areas that do not alter natural processes. Wilderness values are preserved through a "minimum tool" management approach, which requires refuge managers to use the least intrusive methods, equipment, and facilities necessary for administering the areas.
Youth Conservation Corps Act of 1970	Established a permanent Youth Conservation Corps (YCC) program within the Departments of Interior and Agriculture. Within the Service, YCC participants perform many tasks on refuges, fish hatcheries, and research stations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 11593, Protection and Enhancement of the Cultural Environment (1971)	States that if the Service proposes any development activities that may affect the archaeological or historic sites, the Service will consult with Federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.
EO 11644, Use of Off-road Vehicles on Public Land (1972)	Established policies and procedures to ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.
EO 11988, Floodplain Management (1977)	The purpose of this Executive Order 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 floodplains.”
EO 11989 (1977), Amends Section 2 of EO 11644	Directs agencies to close areas negatively impacted by off-road vehicles.
EO 11990, Protection of Wetlands (1977)	Federal agencies are directed to provide leadership and take action to minimize the destruction, loss of degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
EO 12372, Intergovernmental Review of Federal Programs (1982)	Seeks to foster intergovernmental partnerships by requiring federal agencies to use the state process to determine and address concerns of state and local elected officials with proposed federal assistance and development programs.
EO 12898, Environmental Justice (1994)	Requires federal agencies to identify and address disproportionately high and adverse effects of its programs, policies, and activities on minority and low-income populations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 12906, Coordinating Geographical Data Acquisition and Access (1994), Amended by EO 13286 (2003). Amendment of EOs and other actions in connection with transfer of certain functions to Secretary of DHS.	Recommended that the executive branch develop, in cooperation with state, local, and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data. Of particular importance to comprehensive conservation planning is the National Vegetation Classification System (NVCS), which is the adopted standard for vegetation mapping. Using NVCS facilitates the compilation of regional and national summaries, which in turn, can provide an ecosystem context for individual refuges.
EO 12962, Recreational Fisheries (1995)	Federal agencies are directed to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities in cooperation with states and tribes.
EO 13007, Native American Religious Practices (1996)	Provides for access to, and ceremonial use of, Indian sacred sites on federal lands used by Indian religious practitioners and direction to avoid adversely affecting the physical integrity of such sites.
EO 13061, Federal Support of Community Efforts Along American Heritage Rivers (1997)	Established the American Heritage Rivers initiative for the purpose of natural resource and environmental protection, economic revitalization, and historic and cultural preservation. The Act directs Federal agencies to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage.
EO 13084, Consultation and Coordination With Indian Tribal Governments (2000)	Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.
EO 13112, Invasive Species (1999)	Federal agencies are directed to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner, accurately monitor invasive species, provide for restoration of native species and habitat conditions, conduct research to prevent introductions and to control invasive species, and promote public education on invasive species and the means to address them. This EO replaces and rescinds EO 11987, Exotic Organisms (1977).



EXECUTIVE ORDERS	DESCRIPTIONS
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. (2001)	Instructs federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners-in-Flight Bird Conservation plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.



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## *Appendix D. Public Involvement*

### **SUMMARY OF PUBLIC SCOPING COMMENTS**

#### *FISH AND WILDLIFE POPULATION MANAGEMENT*

- Inventory rare plants, mussels, and herpetofauna since little is known about their occurrence, distribution or relative abundance.
- Strategies that restore the natural flora and fauna that pre-dates high-grading of timber would be a positive management step.
- An important management issue is developing an inventory of wildlife and plants so a management strategy can be developed.
- Wildlife and habitat should be managed by focusing on the species of greatest conservation need. Then focus on management of game species.
- More emphasis should be placed on feral hog removal to protect habitat.
- There should be an active duck nesting program since the refuge contains vast areas for brooding young ducks.
- Partner with Georgia DNR to provide refuge areas and manage for the black bear population of middle Georgia.
- The refuge should be managed for wildlife with an emphasis on quality deer management and increased waterfowl development.

#### *HABITAT MANAGEMENT*

- Ensure that policies and upstream management promote hydrologic regimes supportive of wetland and bottomland system integrity.
- Alterations in the hydrologic dynamics of the Ocmulgee River have substantial potential to disrupt natural systems on the refuge.
- The refuge must address feral hogs and growing list of exotic and invasive plants in an effective way.
- Work with partners and volunteers to remove exotic plants from Brown's Mount.
- Bottomland forest habitats and upland systems need to be inventoried as a basis for developing forest and fire management plans.
- A habitat management plan needs to be developed for the refuge that considers desired forest conditions, and the role of silviculture and forest management in creating and perpetuating these conditions.

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- The role of fire as a management tool in the creation and perpetuation of desired upland forest conditions needs critical consideration.
  - The refuge provides one of the best examples of a functioning forested wetland system in the region and could benefit from on-site research that contributes to local as well as landscape scale understanding of forest wetland ecology and conservation.
  - Water and air quality are being affected by encroachment and development upstream on the Ocmulgee River, displacing wildlife and destroying habitat.
  - Select cutting and burning should be used to manage the refuge and keep it as natural as possible.

### *RESOURCE PROTECTION*

- The most important threat facing Bond Swamp is urbanization. Keep Bond Swamp wild by keeping it undeveloped.
- There is limited capacity of Piedmont NWR to provide sufficient law enforcement presence. Vandalism, dumping, and poaching have been prevalent at times.
- Proposed Interstate connectors (Fall Line Freeway and Eisenhower extension) north of the refuge represent a multitude of potential threats to the refuge in the form of water quality concerns, altered hydrology, ancillary residential and commercial growth, habitat fragmentation, complications with future refuge land acquisitions, etc.
- There is a need for better signage, government property identification, and security of areas such as through the utility corridor.
- Preservation efforts in this area should be expanded and the piecemeal governmental ownership and management of this area should be transformed into a unified approach which will better promote and preserve the corridor and yield greater public and private benefits.
- Keep the land as a swamp, not a landscaped federal green space.
- Educate the public on the Archeological Resources Protection Act to prevent such activities as pot hole looting. Implement more monitoring of looters and poachers.
- Designate protected habitat areas to set aside from recreation, hunting, and fishing areas.
- Land acquisition should be the first priority, focusing on parcels at risk for inappropriate development.
- Bond Swamp should have a team of professional archeologists perform a survey to inventory sites within the refuge.

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## VISITOR SERVICES

- Groups that are currently using the refuge that need to be fostered include Audubon and other birders.
- The Brown's Mount area is the best opportunity to increase non-consumptive use.
- Develop canoe launch site at Stone Creek parking area, a canoe trail on Stone Creek, and a canoe take out site on Reid's Station Road.
- Refuge access must be improved before opening the west side to the public.
- Open the west side of the refuge to public use.
- Do not open Brown's Mount to hunting.
- Develop a public boat ramp. Boat access needs to be provided for fishing, hunting, and wildlife watchers.
- Eliminate hog quota hunt and make it an open hunt.
- Quota hunts and restricted seasons like those currently in operation are the way to go.
- Hunting access to the property is way too tight. Allow small game (squirrel, rabbit and raccoon) hunting.
- Explore opportunities for waterfowl hunting.
- Increased access for hunting of all types, especially small game recreational hunting, is important for linking the community to the land.
- Hunting opportunities for deer and hog should be expanded, and turkey hunting should be included.
- Continue to use public hunting as a means to control overpopulation of white-tailed deer and invasive species such as feral hogs.
- Charge a higher use fee for all hunting and fishing permits.
- At primary parking areas and boat launch, post health advisories related to consuming fish.
- Develop wildlife observation trail on Bondview Road.
- Explore the possibility of developing hiking access across Stone Creek near or above the beaver dam area.
- Develop a hiking trail off the powerline access road.
- Look for a good partner to provide environmental education at Brown's Mount.

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- Bond Swamp needs a visitor center. The long linear river corridor actually calls for several visitor centers.
  - Programs need to be developed to get school groups from Macon introduced to the outdoors by using Bond Swamp as an outdoor classroom.
  - More opportunities should be developed for wildlife watching.
  - Initiate programs in the school system and encourage individuals to become involved in the refuge.

#### *REFUGE ADMINISTRATION*

- Lack of staff and an operating budget for Bond Swamp NWR severely impedes the ability of the refuge to contribute to the mission of the NWRS and fulfill its potential ecological role on the landscape.
- There needs to be a Public Use position designated for Bond Swamp that concentrates on Bond Swamp.
- As community interest and volunteer support increases, look for opportunity to support a friend's group for Bond Swamp.
- Encourage volunteerism in the fields of history, biology, hunting, safety, art, and recreation.
- No operating budget, a single FTE that is slated to be abolished, and lack of a nearby office severely limit the capacity for any work on the refuge.
- Preferred tracts for acquisition would greatly enhance the refuge's potential conservation role.
- The most important issue facing the Bond Swamp is the lack of staff and funds for operations. It will take staff and funds to implement a Comprehensive Conservation Plan.
- Bond Swamp should not be managed as a subsidiary of the Piedmont NWR, thirty-five miles or more away. Bond Swamp is located less than ten minutes away from downtown Macon. It needs on-site management, tailored to the characteristics and opportunities afforded by the land and its location next to an urban environment.

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## Draft Plan Comments and Service Responses

This appendix summarizes all comments that were received on the Draft Comprehensive Conservation Plan and Environmental Assessment for Bond Swamp NWR. Public comments on the Draft CCP/EA were accepted from June 22 to July 24, 2009.

A total of 61 individuals submitted comments on the Draft CCP/EA in writing.

### PUBLIC FORUMS

Public forums were not held during the June 22 – July 24, 2009 public review period due to the low turnout in past forums. The notice of availability for a 30-day public review of the Bond Swamp NWR Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the public review period. The Service sent the Draft CCP/EA to the 46 individuals that requested paper or compact disk copy. The Draft CCP/EA was also available for review from the Internet. A news release was posted on the Georgia Outdoor News web site on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news at 6 p.m. and 10 p.m. on July 21, 2009. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. Most comments were received by e-mail.

### AFFILIATIONS OF RESPONDENTS

The table below identifies the names and affiliations of respondents who commented on the Draft CCP/EA.

Name of Respondent	Affiliation
Carol Payton	Middle Georgia Regional Development Council
Elizabeth Shirk	Georgia DNR, Historic Preservation Division
Steve Layson	Bibb County Board of Commissioners
Susan Harper	Macon Museum of Arts and Sciences
Joe Hamilton	Quality Deer Management Association
Gagunr51	
Kenneth Jammes	
Danny Leigh	
John Trussell	
James Smith	
Charles Giles	
Jesse Irvin	
Phil Moss	
R Gatliff	
Glenda Minter	

<b>Name of Respondent</b>	<b>Affiliation</b>
Dennis Callahan	
Will Ellis	
Mr. and Mrs. Calvin Cox	
Glenn Portwood	
Brian Howe	
R.G. Baker	
Duane Culp	
Rocky Baker	
Linda Shine	
J. Michael Widner	
Wayne McFarland	
David Gaddis	
Jackson Bowen	
Ronald Clements and family	
Bruce Turner	
Mitch McCrimmon	
Jack Neary	
Robert Stryker	
Franklin Wood	
S. M. Barela	
Charles Hill	
Mike Mauldin	
James Jackson	
Hawk1936	
James Hale	
George Mitchell	
J. Wiecher	
Frank Wood	
John Sieweke	
Jim Bob	
Max McKelvey	
Al Bowman	
Rockwell Davis	
Al Bowman	
Edward Doll	
Kathy Stege	
Brad Powel	
Ray Schmeck	
Andy Black	



Name of Respondent	Affiliation
Mark Wyzalek	Macon Water Authority
Stephen Hammack	
Steven Harkin	
John Wilson	
Jean Public	
Andrew Page	The Humane Society of the United States

The number of affiliations represented in the above table can be summarized as follows: federal agencies, 0; state agencies, 2; local (city and county) agencies, 2; non-governmental organizations, 4; public citizens (general public), 53.

### COMMENT MEDIA

The types of media used to deliver the comments received by the refuge and planning staffs are categorized as follows: written letter, 7; e-mail, 54.

### GEOGRAPHIC ORIGIN OF RESPONDENTS

The geographic origins of the individual respondents who submitted comments are Georgia, 45; South Carolina, 1; Washington, DC, 1; and New Jersey, 1. Thirteen email comments did not provide state of origin.

### SUMMARY OF CONCERNS AND THE SERVICE'S RESPONSES

The public comments received address the following concerns. The Service's responses to each concern are also summarized.

#### *GENERAL COMMENTS AND LETTERS OF SUPPORT*

**Comment:** Four comments were received that supported the plan in general.

**Comment:** Increased use of refuge by partnership of sportsman and recreational users would be beneficial for both Bibb and Twiggs County and the refuge.

**Comment:** Alternative C offers enhanced opportunities for just about everyone who loves the outdoors including hikers, bird watchers, fishermen, boaters (canoe's), and hunters.

**Service Response:** Comments noted.

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## FISH AND WILDLIFE POPULATIONS – MONITORING

**Comment:** Examination of population density should be incorporated with opening of new species and new lands for hunting.

**Service Response:** The refuge coordinates all hunting with the Georgia DNR's Wildlife Resources Division. Seasons and limits are set on a 2-year cycle with the State of Georgia. Refuge-specific regulations are revised annually. Any new openings for species or lands will be incorporated into the refuge hunt plan. This plan considers available biological information and published literature. The refuge also considers zoning of time and space to decrease conflicts between user groups.

## HABITATS – PRESCRIBED BURNING

**Comment:** There should be no prescribed burning because it produces lung cancer, heart attacks, strokes, pneumonia, allergies, and asthma.

**Service Response:** The Service recognizes the use of prescribed fire as an important tool to restore, maintain, and promote healthy habitat conditions, while also reducing risks associated with wildfires. The CCP proposes to develop a fire management plan to reduce hazardous fuels, and to restore, rehabilitate, and maintain fire-adapted ecosystems consistent with desired future habitat conditions. The refuge will complete a plan that allows prescribed fire use and ensures the plan is in compliance with Federal Wildland Fire Policy. Part of this planning process includes consideration for smoke management and air quality. The refuge works in partnership with other agencies to ensure compliance with the Clean Air Act.

## HABITATS – HYDROLOGY AND WATER QUALITY

**Comment:** From 2000-2009, water withdrawn from the Ocmulgee River by the Macon Water Authority has decreased to an average of 28 million gallons of water per day. Historically, water quality problems were due to point source discharges. Now water impairment problems are related to storm-water runoff/nonpoint pollution.

**Service Response:** Changes were made in this CCP to reflect the updated information on water withdrawn from the Ocmulgee River as stated here. *“The Ocmulgee River, via Lucas Lake Reservoir, is the water source for the Macon Water Authority (MWA) which serves the city of Macon, Bibb County, and portions of Monroe and Jones Counties. In 1989, MWA pumped more than 35 million gallons of water per day from the river (USFWS 1989) but withdrawals now are 28 million gallons per day (MVA 2009). At Macon, the Ocmulgee River had an average daily flow of 1,740 million gallons. Drought conditions have at times severely reduced this flow rate and shall do so again in the future. The Ocmulgee River, south of Macon, historically had water quality problems due to point discharges such as pulp/paper manufacturing and urban sewage effluent. These problems have been corrected due to the Clean Water Act and resulting regulation. Nationally, the primary causes of water impairment are not related to storm-water runoff/nonpoint pollution; many of the water quality impairments in the Ocmulgee watershed are due to such runoff.”*

## HABITATS – WILDERNESS MANAGEMENT

**Comment:** Maintain the property as a wilderness area in the traditional sense of the word. That does not preclude management for the benefit of native plants and animals such as control burns, increased hunting and fishing, and limited improvement of access for hunters and fisherman.

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**Service Response:** The refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. The lands within Bond Swamp NWR were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964 (Appendix H). No lands in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this CCP.

*VISITOR SERVICES (PUBLIC USE) – SUPPORT HUNTING*

**Comment:** Forty-two comments were received that supported and/or endorsed Alternative C, since this alternative would increase hunt opportunities for waterfowl, small game, and turkey, and open access to hunting on west side of the Ocmulgee River.

**Service Response:** Comment noted.

*VISITOR SERVICES (PUBLIC USE) – INCREASE HUNTING OPPORTUNITIES*

**Comment:** Add coyote hunting to reduce predation on turkey nests.

**Service Response:** The CCP core planning team briefly discussed the suggestion of opening coyote hunting at Bond Swamp NWR. It was determined that coyote hunting is not currently needed for population control on the refuge. The biggest threat to ground nesting birds is feral hog activity and periodic spring flooding. The state allows liberal coyote hunting opportunity for recreation on private lands with no closed season or limits imposed. Coyotes may be taken on state wildlife management areas in conjunction with other hunting seasons.

**Comment:** Could there be year-round hunting (hogs) or more hog hunts (non quota)?

**Service Response:** The CCP allows for the expansion of hunting opportunities. Currently, the refuge offers a 3-week archery season for deer and feral hogs and 2 non-quota hog-only gun hunts from December to February. Changes to the refuge hunting program cannot be considered, pending the outcome of a current law suite. At a future date, changes will be considered through amending the refuge hunt plan and associated environmental assessment.

**Comment:** Increase pig hunting and trapping with the purpose to eliminate them. The population should not be managed to provide long-term hunting opportunities. Increase deer hunting to reduce overpopulation.

**Service Response:** The Service manages all hunting on the refuge through the Bond Swamp NWR Hunt Plan and Environmental Assessment. The objectives of the current hunt plan incorporate these comments including eliminating or reducing the feral hog population and maintaining the deer herd within capacity of the habitat.

*VISITOR SERVICES (PUBLIC USE) – IMPROVE FACILITIES THAT SUPPORT HUNTING*

**Comment:** Install primitive camping on site in longleaf pine area.

**Service Response:** The CCP core planning team briefly discussed the suggestion of opening a primitive campground on site at Bond Swamp NWR. Due to the planning, permitting, and maintenance that is involved with managing a campground on a national wildlife refuge, it was determined that the refuge would remain open to the public only for daylight hours.

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*VISITOR SERVICES (PUBLIC USE) – WILDLIFE OBSERVATION*

**Comment:** The trail on the I-16 portion is unpleasant to hike due to highway noise. This could be closed and more intensive wildlife management could occur there, with more public access on the more aesthetically pleasing swamp side.

**Service Response:** The refuge currently offers two hiking trail locations for wildlife observation through foot travel. The Longleaf trail was designed to provide all-weather access through upland habitats, while the Beaver Loop trail provides access into the swamp, which floods periodically throughout the year. The CCP allows for enhanced visitor services and although no change was made to the plan the comment is noted for future reference.

*VISITOR SERVICES (PUBLIC USE) – OPPOSITION TO HUNTING*

**Comment:** Eliminate all hunting on the refuge.

**Comment:** There should be no human disturbance of any kind, including banning hunting and trapping of all species.

**Comment:** Opposed to expansion on public hunting especially deer and waterfowl hunting because it will impact private hunt clubs on adjacent lands. Specifically concerned about the impacts to trophy deer management and trespass on private lands and blocking landowner access roads.

**Service Response:** Hunting is one of the six priority public uses identified in the National Wildlife Refuge System Improvement Act of 1997. The Service allows hunting as long as it is compatible with the mission of the Service, the National Wildlife Refuge System, and the purposes of the refuge.

*VISITOR SERVICES (PUBLIC USE) – ENHANCED ENVIRONMENTAL EDUCATION*

**Comment: (1)** Interested in exploring opportunities to forge partnerships for environmental education at Brown's Mount.

**Service Response:** This CCP has an objective to seek out opportunities to forge partnerships to further environmental education on the refuge and in the community.

*VISITOR SERVICES (PUBLIC USE) – ENHANCED PUBLIC ACCESS*

**Comment:** Increase public access – open canoe trail; add and better maintain hiking trails.

**Comment:** Canoeing for non-hunters also. Explore other options for accessing the creek to facilitate canoeing.

**Comment:** Allow recreational paddling in the spring especially for educational groups.

**Service Response:** The CCP allows for enhanced visitor services including portable boat access along Stone Creek. As resources become available to implement this CCP, improved access and periodic maintenance will be considered.

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## RESOURCE PROTECTION – ARCHAEOLOGY

**Comment:** Include archaeological research to determine the Native American significance of the refuge.

**Service Response:** Under this CCP, the refuge would continue to comply with Section 106 of the National Historic Preservation Act, but there would be no additional active management of cultural resources. Cooperation with the Muscogee Creek Nation in management and protection of Traditional Cultural Properties would continue. Additionally, within 10 years of the date of this CCP, a Phase I cultural resources survey of the refuge would be implemented, and within 15 years of the date of this CCP, the refuge would develop and begin to implement an Integrated Cultural Resources Management Plan.

**Comment:** Conduct the cultural resources overview within 2 years of the date of this CCP, and the Phase I survey within 5 years of the date of this CCP. The Integrated Cultural Resources Management Plan should immediately follow the completion of the Phase I. Refuge staff should complete ARPA training within 1 year of the date of this CCP, and it should be required for each ranger within the first few months of employment.

**Service Response:** This CCP outlines what the Service believes to be a realistic timeline for implementing cultural resources strategies in coordination with the other identified projects and strategies. Training for refuge staff is based on the timeline for obtaining staff through projects identified in this CCP. All proposed projects are based on obtaining the resources to implement them.

**Comment:** More detailed information on types of archaeological sites found in middle Georgia and more non-locational information on known sites at Bond Swamp NWR should be added to this plan.

**Service Response:** Comment is noted but is beyond the scope of this CCP. The CCP serves as an umbrella planning document that will incorporate step down plans that target implementation. The level of detail requested by this comment would be included in the Cultural Resources Overview and subsequent planning documents.

**Comment:** In future planning consult with more archaeologists and review larger breath of published papers to ensure diversity of viewpoints is captured. Include more members of the community with a vested interest in protecting archaeological sites on future planning teams.

**Service Response:** The Service consults with the State Historic Preservation Office and federally recognized Native American tribes as provided by law and agency policy. The Service will consult with state archaeologists and specialists as needed in development of specific projects. The community was encouraged to participate in this planning process through public scoping and public review.

## ADMINISTRATION – FUNDING AND IMPLEMENTATION

**Comment:** Where do the funds come from to implement Alternative C?

**Comment:** Adequately fund the refuge for oversight and to open it to more public use.

**Service Response:** The Service has prepared this CCP to guide the management of Bond Swamp NWR for the next 15 years. The CCP outlines programs and corresponding resource needs but does not provide any direct funding. As funding and resources become available, the refuge will implement those corresponding strategies.

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## *ADMINISTRATION – FACILITIES AND ACCESS*

**Comment:** No new roads should be built; the less people in the site the better. Let the animals and birds have peace in their lives.

**Service Response:** The Service promotes wildlife first on national wildlife refuges but also allows wildlife-dependent recreation when compatible with the Service's mission and the refuge's purpose. This plan promotes enhanced biological and visitor services programs at Bond Swamp NWR. Improved access where appropriate and compatible will promote the refuge's purposes that include "provides and enhances opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, and other compatible public uses."

## *ADMINISTRATION LAND SWAP*

**Comment:** Work with Ocmulgee National Monument to facilitate the creation of an Ocmulgee National Park which would include Bond Swamp NWR. The Service could transfer the refuge to the NPS in exchange for the state donating its Ocmulgee and Oakey Woods lands to the Service. Ideally it would be transferred to the NPS because its cultural, tourism, and recreational significance is where its greatest value lies. This study should incorporate the discussion or facts pertaining to Chris Watson's dissertation on creating a national park and preserve in it.

**Service Response:** Comment noted but it is outside of the scope of this CCP. The refuge will continue to pursue opportunities to work with partners to further the Service's mission and refuge's purpose.

## *ADMINISTRATION – ADD VISITOR SERVICE FACILITIES*

**Comment:** Bond Swamp NWR should have its own visitor center and not be managed as a satellite entity (of Piedmont NWR) from 40 miles away.

**Service Response:** This CCP addresses the administration of Bond Swamp NWR as an independent refuge as additional resources become available. Project 17 includes construction of an office and maintenance shop on site. The core planning team did not address a specific visitor center project because it believes the first step will be to gain the resources needed and identified in this CCP. The construction of a visitor center would be considered when this CCP is reviewed 15 years its implementation date.

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## *Appendix E. Appropriate Use Determinations*

### **Bond Swamp National Wildlife Refuge Appropriate Use Determinations**

An appropriate use determination is the initial decision process a refuge manager follows when first considering whether or not to allow a proposed use on a refuge. The refuge manager must find that a use is appropriate before undertaking a compatibility review of the use. This process clarifies and expands on the compatibility determination process by describing when refuge managers should deny a proposed use without determining compatibility. If a proposed use is not appropriate, it will not be allowed and a compatibility determination will not be undertaken.

Except for the uses noted below, the refuge manager must decide if a new or existing use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility. Uses that have been administratively determined to be appropriate are:

- Six wildlife-dependent recreational uses - As defined by the National Wildlife Refuge System Improvement Act of 1997, the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) are determined to be appropriate. However, the refuge manager must still determine if these uses are compatible.
- Take of fish and wildlife under state regulations - States have regulations concerning take of wildlife that includes hunting, fishing, and trapping. The Service considers take of wildlife under such regulations appropriate. However, the refuge manager must determine if the activity is compatible before allowing it on a refuge.

#### **Statutory Authorities for this policy:**

**National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. §668dd-668ee.** This law provides the authority for establishing policies and regulations governing refuge uses, including the authority to prohibit certain harmful activities. The Act does not authorize any particular use, but rather authorizes the Secretary of the Interior to allow uses only when they are compatible and “under such regulations as he may prescribe.” This law specifically identifies certain public uses that, when compatible, are legitimate and appropriate uses within the Refuge System. The law states “. . . it is the policy of the United States that . . . compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System . . . compatible wildlife-dependent recreational uses are the priority general public uses of the System and shall receive priority consideration in refuge planning and management; and . . . when the Secretary determines that a proposed wildlife-dependent recreational use is a compatible use within a refuge, that activity should be facilitated . . . the Secretary shall . . . ensure that priority general public uses of the System receive enhanced consideration over other general public uses in planning and management within the System . . . .” The law also states “in administering the System, the Secretary is authorized to take the following actions: . . . issue regulations to carry out this Act.” This policy implements the standards set in the Act by providing enhanced consideration of priority general public uses and ensuring other public uses do not interfere with our ability to provide quality, wildlife-dependent recreational uses.

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**Refuge Recreation Act of 1962, 16 U.S.C. 460k.** The Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

**Other Statutes that Establish Refuges, including the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) (16 U.S.C. §410hh - 410hh-5, 460 mm - 460mm-4, 539-539e, and 3101 - 3233; 43 U.S.C. 1631 et seq.).**

**Executive Orders.** The Service must comply with Executive Order 11644 when allowing use of off-highway vehicles on refuges. This order requires the Service to designate areas as open or closed to off-highway vehicles in order to protect refuge resources, promote safety, and minimize conflict among the various refuge users; monitor the effects of these uses once they are allowed; and amend or rescind any area designation as necessary based on the information gathered. Furthermore, Executive Order 11989 requires the Service to close areas to off-highway vehicles when it is determined that the use causes or will cause considerable adverse effects on the soil, vegetation, wildlife, habitat, or cultural or historic resources. Statutes, such as ANILCA, take precedence over executive orders.

**Definitions:**

Appropriate Use

A proposed or existing use on a refuge that meets at least one of the following four conditions:

- 1) The use is a wildlife-dependent recreational use as identified in the Improvement Act.
- 2) The use contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law.
- 3) The use involves the take of fish and wildlife under state regulations.
- 4) The use has been found to be appropriate as specified in section 1.11.

Native American. American Indians in the conterminous United States and Alaska Natives (including Aleuts, Eskimos, and Indians) who are members of federally recognized tribes.

Priority General Public Use. A compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Quality. The criteria used to determine a quality recreational experience include:

- Promotes safety of participants, other visitors, and facilities.
- Promotes compliance with applicable laws and regulations and responsible behavior.
- Minimizes or eliminates conflicts with fish and wildlife population or habitat goals or objectives in a plan approved after 1997.
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation.
- Minimizes conflicts with neighboring landowners.
- Promotes accessibility and availability to a broad spectrum of the American people.
- Promotes resource stewardship and conservation.



- 
- Promotes public understanding and increases public appreciation of America's natural resources and the Service's role in managing and protecting these resources.
  - Provides reliable/reasonable opportunities to experience wildlife.
  - Uses facilities that are accessible and blend into the natural setting.
  - Uses visitor satisfaction to help define and evaluate programs.

*Wildlife-Dependent Recreational Use.* As defined by the Improvement Act, a use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Bond Swamp NWR

Use: Boating

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate

Refuge Manager: *A Signed*

Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: *E Signed*

Date: 9/14/09

A compatibility determination is required before the use may be allowed.

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**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Bond Swamp NWR

Use: Firewood Cutting

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate \_\_\_\_\_       Appropriate ✓  
 Refuge Manager: *[Signature]* **Signed** \_\_\_\_\_      Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

for Refuge Supervisor: *[Signature]* **Signed** \_\_\_\_\_      Date: 9/14/09

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319  
02/06

**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Bond Swamp NWR

Use: Forest Management

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate

Refuge Manager: *[Signature]* **Signed**

Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: *[Signature]* **Signed**

Date: 9/14/09

A compatibility determination is required before the use may be allowed.

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**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Bond Swamp NWR

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate

Refuge Manager: [Signature] **Signed**

Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

for Refuge Supervisor: [Signature] **Signed**

Date: 9/14/09

**A compatibility determination is required before the use may be allowed.**

FWS Form 3-2319  
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**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Bond Swamp NWR

Use: Off Road Vehicles (handicapped use only)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 503 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate

Refuge Manager: *[Signature]* **Signed**

Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: *[Signature]* **Signed**

Date: 9/14/09

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319  
02/06

**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Bond Swamp NWR

Use: Walk, Jog, Bike

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes  No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate

Refuge Manager: *[Signature]* **Signed**

Date: 8-27-09

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: *[Signature]* **Signed**

Date: 9/14/09

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319  
02/06





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## Appendix F. Compatibility Determinations

### Bond Swamp National Wildlife Refuge Compatibility Determination

**Uses:** The following uses were found to be appropriate and evaluated to determine their compatibility with the mission of the Refuge System and the purposes of the refuge.

1. Hunting
2. Fishing
3. Environmental Education and Interpretation
4. Wildlife Observation and Photography
5. Boating
6. Firewood Cutting
7. Forest Management
8. Off Road Vehicles (disable use only)
9. Research
10. Walking, Jogging, Bicycling

**Refuge Name:** Bond Swamp National Wildlife Refuge.

**Date Established:** October 16, 1989

**Establishing and Acquisition Authorities:** Fish and Wildlife Act of 1956 (16 U.S.C. 742f(b)(1)); Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b) 100 Stat. 3583).

**Refuge Purpose:** "... for the development, advancement, management, conservation, and protection of fish and wildlife resources...." and "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..."

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions..."

### 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)

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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 CFR Subchapter C; 43 CFR 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, USC668dd)  
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System. March 25, 1996  
Title 50, Code of Federal Regulations, 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” and the succeeding sections, “Literature Cited,” “Public Review,” and the “Approval of Compatibility Determinations” 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.

### **Description of Use: Hunting**

Recreational hunting of white-tailed deer and feral hogs in accordance with State of Georgia regulations and refuge-specific regulations.

**Availability of Resources:** Minimal funding in the amount of \$15,000 annually must be available to fully implement the current hunting program. Funding is necessary to provide initial protection to the resources, implement hunt programs, provide and ensure safe access for all users and collect biological data to ensure compliance. Based on a review of the refuge budget allocated for recreational use management, there is adequate funding to ensure compatibility and to administer and manage the recreational use(s).

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**Anticipated Impacts of the Use:** White-tailed deer and feral hogs are the most common mammals observed in the refuge. The local area has a long standing tradition of hunting deer and feral hogs. Limited hunting for these species has occurred on the refuge since 1999. Limited deer and feral hog hunting can provide the public with compatible wildlife oriented recreation through the use of a renewable resource.

Regulated big-game hunting can be used as a management tool designed to control herbivore population levels to ensure that these animals do not adversely impact the environment. White-tailed deer have the ability to overpopulate areas, which can result in heavy browsing on native forest communities and habitat destruction (Halls 1978, Hesselton and Hesselton 1982, Halls 1984, Bratton 1989). If left uncontrolled, white-tailed deer can become so numerous that they may adversely affect their habitat to the point of altering ecological diversity and succession (Warren 1991). Research has documented that increasing deer populations can alter vegetation composition and diversity, threaten abundance of less common plant species, and alter unique habitats (Bratton 1979). In addition, research has documented that changes in vegetation attributed to increasing deer populations affect other wildlife species. Studies have documented declines in song bird species density and diversity and bird species richness and abundance where overbrowsing of understory and shrub-layer vegetation occurred (Boone and Dowell 1986, deCalesta 1994). Impacts of white-tailed deer population on the environment have been well documented and accepted through research over a period of many years. A list of literature reviewed to help make this compatibility determination is attached.

Bond Swamp NWR is mandated to manage for native wildlife species and their associated habitats. The presence of feral and non-native species is inconsistent with this objective. Therefore, it is refuge policy to control or eliminate all non-native and feral animal species. The population of feral hogs is from a domestic stock and not the Eurasian type. While elimination of feral hogs may be futile, the refuge must try to control the population to reduce damage to the habitat. Habitat damage from feral hogs has been documented by refuge staff since the refuge was established in 1989.

Hogs leave large areas of disturbed earth where they have rooted or wallowed. They compete with native species of deer, bear, squirrel, and turkey for mast foods such as acorns during the fall and winter. They can destroy eggs of ground-nesting gamebirds such as wild turkey, bobwhite quail, American woodcock, as well as ground-nesting neotropical migratory birds, such as chuck-will's-widow, Kentucky warbler, Louisiana waterthrush, black-and-white warbler, and common yellowthroat. Hogs also destroy the leaf litter habitat of surface tunneling mammals, such as the southeastern and short-tailed shrew. Wildflowers and pines can also be adversely affected because the flowers and pine roots are favorite food items for hogs. Feral hogs can also carry and transmit diseases to other wildlife, such as Pseudorabies, a viral disease, and Brucellosis, a bacterial infection.

Properly regulated recreational hunting of certain game species should not have any adverse impacts on either the wildlife resources or other natural resources of the refuge. There may be some limited disturbance to certain non-target species of wildlife. However, this should be short-lived and relatively minor, and is not expected to negatively impact the wetland values of the refuge. Problems associated with littering and illegal take of game (non-authorized species such as the commercially valuable black bear, over bag limit, etc.) will be controlled through effective law enforcement and education. Some sensitive areas of the refuge may have limited access and use. A primary protection zone of 700 feet around an active bald eagle nest will be closed to all public access.

In 2000, the refuge added 786 acres in fee title on the west side of the Ocmulgee River. In July 2006 the Service and State of Georgia signed a management agreement for the refuge to manage 1,072 acres of state-owned land within the acquisition boundary. Currently, the refuge manages 7,348 acres and 5,455 acres are open to hunting. A summary of harvest and hunter numbers from 1999-2006 is attached.

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Hunting in this area is considered to be a traditional form of wildlife-dependent recreation. Allowing the public to hunt on the refuge will result in a positive public opinion and will help build support for the Service and its natural resource conservation agenda. It will also be allowed and managed on the refuge to assure biological sound use of a renewable resource. The hunt program will help the refuge manage the deer and hog populations to prevent habitat destruction and negative impacts on other wildlife species.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Hunting may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

The refuge will be open for public use during daylight hours only.

Vehicle use will be limited to open maintained roads.

Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.

Boats or other personal equipment may not be left on the refuge overnight.

No gasoline boat motors will be allowed, except on the Ocmulgee River.

Firearms/bows will be prohibited except during permitted refuge hunts.

Biological data will be collected and analyzed to ensure that the hunts are biologically sound and annual hunt evaluation reports discussing compatibility will be prepared by refuge staff.

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An active refuge law enforcement program will ensure regulation compliance and protect refuge resources.

No public camping will be allowed.

During the 15-year life of the CCP, additional refuge-specific regulations may be implemented.

**Justification:** The Service's current policy is to expand and enhance opportunities for quality hunting and fishing on national wildlife refuges (Babbitt 1995). Hunting is considered to be compatible with the refuge purpose and meets one of the refuge objectives, to provide for compatible wildlife-dependent recreation. Allowing hunting follows current Service policy to expand and enhance opportunities for quality fishing and hunting on refuges. Allowing hunting also helps to maintain and build support for the Service and other wildlife conservation efforts. There has been substantial historical use of these wetland areas for hunting. Based on the available information, there is no indication of adverse biological impacts associated with these activities.

Allowing well-managed hunting of white-tailed deer and feral hogs is consistent with refuge objectives and follows current Service policy. The interim hunt plan is conservatively based and designed to meet management needs. The primary purpose of allowing public hunting of white-tailed deer and feral hogs is to control herbivore populations in balance with their habitat and other wildlife species. The proposed hunt program will provide quality public recreation through the harvesting of a renewable natural resource.

Based on the available information, it has been determined that the expected level of public hunting of white-tailed deer and feral hogs that will occur within the Bond Swamp NWR is compatible with the purposes for which the refuge was established and is biologically sound.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 15-year Re-evaluation Date:** 09/24/2024

### **Description of Use: Fishing**

Recreational fishing in accordance with State of Georgia regulations and refuge specific regulations.

**Availability of Resources:** Minimal funding in the amount of \$5,000 annually must be available to fully implement the current fishing program. Funding is necessary to provide initial protection to the resources, implement fishing programs, provide and ensure safe access for all users and collect biological data to ensure compliance. Based on a review of the refuge budget allocated for recreational use management, there is adequate funding to ensure compatibility and to administer and manage the recreational use(s).

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**Anticipated Impacts of the Use:** The dynamic nature of the flooding regime between the Ocmulgee River and associated wetland habitats along its floodplain, provide constant and renewable fisheries resource. Fish found in the watershed are warm water species. Bass, catfish, rough fish, darters, and minnows are common to the area. The local area has a long-standing tradition of fishing. Limited fishing has occurred on the refuge since 1999. Limited fishing can provide the public with compatible wildlife-dependent recreation through the use of a renewable resource.

Properly regulated recreational fishing of certain game species should not have any adverse impacts on either the wildlife resources or other natural resources of the refuge. There may be some limited disturbance to certain non-target species of wildlife. However, this should be short-lived and relatively minor, and is not expected to negatively impact the wetland values of the refuge. Problems associated with littering and illegal take of fish (non-authorized species, under the size limit, etc.) will be controlled through effective law enforcement and education. Some sensitive areas of the refuge may have limited access and use. A primary protection zone of 700 feet around an active bald eagle nest will be closed to all public access.

In 2000, the refuge added 786 acres in fee title on the west side of the Ocmulgee River. In July 2006 the Service and State of Georgia signed a management agreement for the refuge to manage 1,072 acres of state-owned land within the acquisition boundary. Currently, the refuge manages 7,348 acres

Fishing in this area is considered to be a traditional form of wildlife-dependent recreation. Allowing the public to fish on the refuge will result in a positive public opinion and will help build support for the Service and its natural resource conservation agenda. It will also be allowed and managed on the refuge to assure biological sound use of a renewable resource.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Fishing may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

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The refuge will be open for public use during daylight hours only.

Vehicle use will be limited to open maintained roads.

Some areas of the refuge may be zoned or restricted to season of use while other areas may be closed to all public use.

Firearms/bows will be prohibited except during permitted refuge hunts.

An active refuge law enforcement program will ensure regulation compliance and protect refuge resources.

No public camping will be allowed.

During the 15-year life of the CCP, additional refuge-specific regulations may be implemented.

**Justification:** The Service's current policy is to expand and enhance opportunities for quality hunting and fishing on national wildlife refuges (Babbitt 1995). Fishing is considered to be compatible with the refuge purpose and meets one of the refuge objectives, to provide for compatible wildlife-dependent recreation. Allowing fishing follows current Service policy to expand and enhance opportunities for quality fishing and hunting on refuges. Allowing fishing also helps to maintain and build support for the Service and other wildlife conservation efforts. There has been substantial historical use of these wetland areas for fishing. Based on the available information, there is no indication of adverse biological impacts associated with these activities.

Allowing well-managed fishing is consistent with refuge objectives, and follows current Service policy. Continuing the fishing program will provide quality public recreation through the harvesting of a renewable natural resource.

Based on the available information, it has been determined that the expected level of public sport fishing that will occur within the Bond Swamp NWR is compatible with the purposes for which the refuge was established and is biologically sound.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 15-year Re-evaluation Date:** 09/24/2024

### **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, cultural and historical significance, 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

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the future, these programs 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 interpretative panels will be developed at key refuge entrance points, at current interpretative 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 the environmental education/interpretation program.

**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 county, 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 interpretative 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 review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with 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 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.



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**Justification:** Environmental education and interpretation 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, cultural and historic events and artifacts, and ecosystems will lead to improved support of the Service's mission to protect our natural resources.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 15-year Re-evaluation Date:** 09/24/2024

**Description of Use: Wildlife Observation and Photography**

Wildlife observation and photography are public uses that will allow the visiting public to enjoy, experience, and learn about native wildlife, plants, and habitats. Wildlife observation and photography on the 7,348 acres currently managed by the refuge will have negligible impacts on the refuge unit's resources. Non-consumptive wildlife observation uses, such as bird watching, 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 10,000 – 12,000 visits/year are attributed to wildlife observation and related activities. There are three dedicated hiking trails as well as many unmarked abandoned roads, logging roads, and trails located throughout the refuge.

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.

Information regarding wildlife observation and photography opportunities will be placed in the general refuge brochure and at kiosks located at the parking lots of the three designated trails, Stone Creek, Longleaf, and Brown's Mount. The trails will be marked to allow for self-guided tours. The refuge will be open during daylight hours for the entire year, except for certain location which may closed from time to time due to various management operations.

**Availability of Resources:** Refuge staff plan and implement all wildlife observation and photography activities. The refuge has sufficient staff to accomplish these activities. There are three designated trails located on the east side of the refuge that facilitate wildlife observation and photography by the public. No improvements are needed to conduct the use. All maintenance costs associated with the upkeep of the trails will be borne by the refuge. It is anticipated that the yearly maintenance cost will be \$2,500. Monitoring wildlife observation and photography activities is an administrative function; costs are accounted for in personnel salaries.

**Anticipated Impacts of the Use:** *Short-term impacts:* Wildlife observation and photography activities may result in some disturbance to wildlife if visitors venture too close to bird rookeries. Refuge road systems, foot trails, photo blinds, boardwalks, and wildlife observation platforms will be

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located to minimize disturbance that 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.

*Long-term impacts:* Construction of foot trails, boardwalks, observation platforms, and the upgrading of refuge roads 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 roads by the public does incur added maintenance costs.

*Cumulative impacts:*

Wildlife observation and photography should not contribute substantially to negative cumulative impacts on the habitat and associated wildlife. Some disturbance will occur but should not cause impacts beyond the immediate vicinity of the activity.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Wildlife observation and photography may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

The refuge will be open for public use during daylight hours only.

Vehicle use will be limited to open, maintained roads.

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Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.

An active refuge law enforcement program will ensure compliance with regulations and protect refuge resources.

No public camping will be allowed.

During the 15-year life of the CCP, additional refuge-specific regulations may be implemented.

**Justification:** Wildlife observation and photography are important and preferred public uses at Bond Swamp National WWR and of the Refuge System. The 1997 National Wildlife Refuge System Improvement Act identified wildlife observation and photography as priority public recreational uses 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.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 15-year Re-evaluation Date:** 09/24/2024

**Description of Use: Boating**

The use of non-motorized boats and boats with electric motors for recreational purposes on Bond Swamp NWR is a minor use which occurs on the refuge. Although it is not a priority public use, it can be associated with several priority uses such as hunting, fishing, and wildlife observation.

**Availability of Resources:** No additional fiscal resources are needed to conduct this use. Funding for this program is borne by annual operation and maintenance funds, which include activities involving the public such as recreation, interpretation, environmental education, and conduct of refuge hunting and fishing programs. Existing staff can administer permits and monitor use as part of routine management duties.

**Anticipated Impacts of the Use:** Short-term impacts: Most of the impacts that could occur will involve some violation of refuge regulations such as deliberate disturbance of wildlife or plants, littering, or vandalism. Disturbance to trust species during critical wintering periods is mitigated by seasonal closure. Short-term impacts to facilities such as roads and structures can be avoided by special closures due to unsafe conditions.

Long-term impacts: No long-term negative impacts are anticipated.

Cumulative impacts: No cumulative negative impacts are anticipated; however, programs may be modified in the future to mitigate unforeseen impacts.

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**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with 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. The current regulation that prohibits entry after daylight hours will be maintained. No gasoline motors will be allowed. Boating will be allowed seasonally so as not to adversely interfere with wintering waterfowl usage patterns.

**Justification:** The primary objective for which the refuge was established is to provide the public with wildlife-dependent recreational opportunities. Non-motorized boating and boating with electric motors at the refuge, which adheres to established regulations, is an activity that is compatible with that purpose.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date:** 09/24/2019

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## **Description of Use: Firewood Cutting**

Cutting firewood for personal use through a special use permit system would be allowed on the refuge. It is limited by permitting the cutting of only downed trees. The nature of the use restricts the activity to fresh downed trees adjacent to roads open to vehicles. Standing dead or live trees cannot be cut and permittees cannot travel off a regular maintained road. It is a self limiting activity that primarily involves rural neighbors. Permit numbers are often dependent upon the occurrence of storms that increase the availability of downed trees.

This use would take place along roads that are open to vehicles. Firewood cutting would be allowed year-round. However, requests for permits usually occur in the late fall and winter. Individuals would be able to obtain a permit from the refuge headquarters during normal business hours.

This activity would allow the public to utilize a renewable resource to help heat homes and save fossil fuel while still protecting refuge micro habitats. Firewood cutting on the refuge primarily would involve storm downed trees adjacent to main roads. Standing trees and snags would be protected. The use would have no real cost to the refuge and will not materially interfere with, nor detract from the purposes for which the refuge was established.

**Availability of Resources:** The refuge has adequate resources to cover the cost of the proposed use. No special equipment, facilities, or improvements are needed to support the use. There would be no maintenance or monitoring costs.

**Anticipated Impacts of the Use:** Short-term impacts: Firewood cutting as proposed would not impact the refuge mission or management activities. The activity would cause some temporary disturbance to wildlife from noise and trampling of vegetation. The impact would be short in duration and limited in scope. As proposed, firewood cutting would have minimum impact on refuge resources. Disturbance to wildlife from automobile and foot traffic associated with firewood cutting is not known to be a problem.

Long-term impacts: The primary biological impact of firewood cutting as proposed would be the removal of ground logs and downed timber and limbs. Dead and decaying ground logs and deadfalls are important forest ecosystem micro habitats. Fallen dead trees provide insects and other food for small animals like salamanders, lizards, snakes, mice, and insects, which in turn, provide food for larger animals (Jackson et. al. 1981). Communities of micro-fauna found in decaying wood play a critical role in forest decomposition and nutrient cycling. Firewood cutting as proposed on the refuge would not materially impact these important micro-habitats, because only relatively fresh fallen trees would be removed. These trees would be within close proximity to main roads and found in limited numbers. Valuable snags and standing dead trees would be protected from any cutting.

Cumulative impacts: Firewood cutting as proposed would not contribute to any substantive impacts to the refuge forest system. The use is self limiting to roadsides. The removal of downed trees from roadsides would reduce maintenance associated with other habitat management activities such as prescribed burning and mowing.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46

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individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

Firewood cutting for personal use will be conducted through a special use permit system.

Parts of the refuge will be closed to public access to avoid user conflicts with other management programs. Areas closed to public use will be posted and patrolled.

An active refuge law enforcement program will ensure regulation and permit compliance and will protect refuge resources and the public.

Only dead and downed trees will be cut.

The activity will be monitored to ensure it does not reach a level to materially impact micro habitats.

Vehicle use will be limited to roads designated as open.

**Justification:** A limited number of firewood permits will be issued to permit the public to utilize a renewable resource. Firewood is used to help heat homes and save fossil fuels. This activity involves storm-downed trees next to main roads. Standing trees and snags are protected. The use has no real cost to the refuge and will not materially interfere with, or detract from the purposes for which the refuge was established.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date: 09/24/2019**

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## Description of Use: Forest Management

This use is being proposed to manage for native wildlife species and their associated habitats through forest thinnings and regeneration methods. Managing the forest will also benefit other migratory and resident wildlife.

Forest management objectives support refuge objectives: 1) Improve habitat for resident and migratory wildlife; 2) Restore and maintain upland oak-pine and bottomland hardwood habitat throughout the refuge; 3) Restore habitat diversity, especially canebrakes, throughout refuge bottomlands; 4) Reduce hazardous fuels, especially in the Wildland-Urban Interface; 5) Address southern pine beetle (SPB) outbreaks in the upland oak-pine habitat.

The most significant and inexpensive tool for the enhancement of wildlife habitat is active forest management. In fact, forest management is the only tool available that can realistically enable achievement of refuge wildlife objectives given the fact that the entire refuge is forested. Of necessity, accomplishment of habitat improvement (the only reason for doing active forest management on refuge) heavily utilizes the commercial sale of refuge forest products to accomplish needed habitat improvements. Active forest management consists of mechanical removal of commercial and non-commercial forest products by refuge personnel or contractors utilizing conventional logging equipment.

Some silvicultural techniques employed to achieve management objectives may meet the Hazard Fuel Reduction and/or Wildland-Urban Interface mitigation goals of the 10-Year Comprehensive Strategy and the key points of the 2001 National Fire Plan.

There are approximately 200 acres of open water, 1,040 acres of uplands dominated by oak-pine stands, and 6,108 acres of bottomland hardwoods on Bond Swamp NWR. The Georgia Department of Natural Resources owns 1,072 acres that are under a cooperative land management agreement and managed as part of the 7,348 acre Bond Swamp NWR. Forest management activities occur year-round.

Forest inventory and tree marking activities are conducted and silvicultural prescriptions written by refuge staff. Prescriptions are reviewed by the Service, and then implemented by refuge staff through a public bid process and special use permits. A Section 7 Endangered Species Consultation and a Section 106 Request for Cultural Resource Compliance are sent to their respective office for review and concurrence. Emergency operations carried out to control southern pine beetle or other natural disasters/occurrences will be conducted under special use permits.

**Availability of Resources:** Refuge staff plan and implement all forest management activities. The refuge has sufficient staff to accomplish these activities. All maintenance costs associated with a commercial timber sale or salvage operation will be borne by the special use permit holder. Monitoring forest management activities is an administrative function; costs are accounted for in personnel salaries.

**Anticipated Impacts of the Use:** *Short-term impacts:* Forest management activities may disturb the soil, causing concerns about non-point source pollution (i.e., soil erosion and stream sedimentation). The Federal Water Pollution Control Act mandated states to develop a program to protect and improve the physical, chemical, and biological integrity of the nation's waterways. The practices developed are called Best Management Practices (BMPs). Using BMPs to control soil erosion and stream sedimentation is the most appropriate forestry practice to attain a silvicultural goal while protecting the integrity of waterways. BMP implementation is a mandatory practice on the refuge.

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*Long-term impacts:* Managing the oak-pine bottomland hardwood stands will greatly improve the habitat for resident wildlife and migratory birds such as Swainson's warbler. Several pine beetle species, including southern pine beetle (SPB), Ips beetle, and the black turpentine beetle, can threaten both oak-pine and bottomland hardwood stands. The highest threat is from SPB outbreaks. Thinning these stands to a desired basal area lowers the risk from SPB infestation. Drought stresses trees, reducing their vigor and increasing susceptibility to insects and diseases. Oak-pine stands with a high basal area cease growth under conditions of low available water. However, oak-pine stands thinned to within a desirable basal area range grow continuously, even during severe drought. This greatly reduces the susceptibility of a stand to insect or disease outbreaks, even during drought. Most high-priority neotropical migratory birds are best managed for in bottomland hardwoods. Examples of priority bird species include the yellow-billed cuckoo, Kentucky warbler, prothonotary warbler, and the Acadian flycatcher. Birds are not the only animals that benefit from forest management. Deer and turkey benefit from the increase in herbaceous growth and mast production from thinned forest stands.

*Cumulative impacts:*

Forest management is producing a sustained yield of resources and benefits from the forest. The highest potential negative impact of the use is not having the use. This will lead to the decline of all habitats within the refuge.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** All management actions will be in accordance with Service and Regional policies and guidelines, and with approved forest management prescriptions. Refuge staff will monitor all permitted forest management operations to ensure they are in compliance with special use permit conditions. Any special use activity not in compliance will be immediately stopped. All of Georgia's BMPs for Forestry will be followed.



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**Justification:** Forest management, including thinning and regeneration of the oak-pine and bottomland hardwood forest on Bond Swamp National Wildlife Refuge, is required to maintain and improve the habitat needed by native wildlife and migratory birds. Thinning is necessary to improve mast production in upland and bottomland oaks and to encourage canebrake expansion in the bottomlands. This is necessary to manage for other migratory and resident wildlife on the refuge. Silviculture is an important component in meeting Hazard Fuel Reduction and/or Wildland-Urban Interface mitigation goals of the 10-Year Comprehensive Strategy and the key points of the 2001 National Fire Plan. Forest management is a compatible, justified, and vital part of refuge management.

The Code of Federal Regulations states, "We may only authorize public or private economic use of the natural resources of any national wildlife refuge ... where we determine that the use contributes to the achievement of the national wildlife refuge purposes or the National Wildlife Refuge System mission" (50 CFR 29.1). The first purpose of the refuge is to "Conserve, restore, and enhance in their natural ecosystems (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered." The second purpose is to "Perpetuate the migratory bird resource." Managing the oak-pine and bottomland hardwood forest will greatly improve the habitat for migratory and resident wildlife. Forest management not only contributes to the achievement of refuge purposes but is necessary to the achievement of refuge purposes. The only cost-effective way to conduct forest management is through a public bid process and special use permits.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date:** 09/24/2019

**Description of Use: Off-Road Vehicles (disabled wheelchair-bound hunter use only)**

Use of off-road all-terrain vehicles (4- to 6-wheel ATVs or vehicles) by disabled wheelchair-bound hunters is essential in providing adequate hunting opportunities for these individuals. The terrain and lack of an adequate, existing road system make the use of ATVs the most cost-effective method of providing access for disabled hunters. Use is restricted to transportation to and from designated hunting locations, including the transport of personal gear and game taken by the disabled hunter. Carrying one permitted assistant is also permitted.

This use would be allowed in designated areas open to hunting on the refuge. Use is only allowed during established refuge hunting seasons with a refuge permit.

Off-road access by disabled hunters is allowed to wheelchair-bound persons with written documentation from a physician, stating that they are mobility impaired and confined to a wheel-chair permanently or temporarily, with date of impairment. A refuge special use permit is issued for a specified hunt period, and access is restricted to a designated route of travel along existing foot travel, and/or management access road. No access is given for roads open to vehicles, power lines, or other rights-of-way. The request of hunting location is taken on a first-come, first-serve basis and coordinated with other refuge activities. Sensitive areas, hazardous areas, and inclement weather

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are factors considered in restricting use at discretion of the refuge manager. This permit grants no other privileges other than access by ATV or vehicle on designated routes on the refuge. The permittee must comply with all other refuge and state hunting regulations.

This use supports the Americans with Disabilities Act by facilitating quality hunting opportunities to wheelchair-bound persons. The use of ATVs is essential in providing a safe and enjoyable opportunity for these individuals.

**Availability of Resources:** Resources involved in the administration and management of the use include review and issuance of special use permits. No special equipment, facilities, or improvements are necessary to support the use. Maintenance costs, such as mowing and clearing refuge foot travel roads prior the hunt, would be minimal. These roads are normally maintained on a 2-year cycle, if not used during the special hunt and support other management and recreational activities. Monitoring costs include all monitoring conducted in conjunction with the refuge hunting program, and no additional costs will be attributed to this program.

**Anticipated Impacts of the Use:** Short-term impacts: Impacts to wildlife, plants, and habitat by the use of off-road vehicles are well documented and some disturbance to wildlife, plants, and their habitats is expected to occur. However, this minor impact is acceptable in providing suitable access to disabled hunters who use ATVs or vehicles to access hunting opportunities on the refuge. Permits are issued for limited days and limit one hunter to a location.

Long-term impacts: No long-term impacts are expected due to the short duration and limited scope of anticipated use.

Cumulative: No cumulative impacts are anticipated with this use.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

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**Stipulations Necessary to Ensure Compatibility:** The refuge has established a policy for the level of disability that necessitates the use of ATVs for hunting. Prior to issuance of a special use permit, persons applying for disabled hunter status must provide written proof of disability (wheelchair-bound for mobility) from their physician, which is reviewed. All other refuge regulations apply.

**Justification:** A primary objective for which the refuge was established is to provide the public with wildlife-dependent recreation. Allowing wheelchair-bound hunters to use off-road vehicles to pursue their sport provides this group with no more opportunity than that which is afforded to the general public. Provided this activity adheres to the refuge regulations, it is an activity which is compatible with refuge objectives.

**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement  
 Categorical Exclusion and Environmental Action Statement  
 Environmental Assessment and Finding of No Significant Impact  
 Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date: 09/24/2019**

### **Description of Use: Research**

This use involves research or other ecological investigations not conducted by the Service or Service-authorized agent. Research by non-Service personnel is conducted by colleges and universities, and federal, state, and local agencies. We also consider research for other purposes that may not relate directly to refuge-specific objectives, but that may contribute to the broader enhancement, protection, use, conservation, or management of native populations of fish, wildlife, and plants and their natural diversity in the region or the Atlantic Flyway. All proposals must comply with Service policy on compatibility.

Specific areas open for research will be stipulated in conditions of a special use permit, including access points. Research could potentially occur throughout the year. The mechanics of the research will depend entirely on the individual research project. We will carefully scrutinize the objectives, methods, and approach of each research project before allowing it on the refuge. The refuge will not allow any research project that lacks an approved study plan and protocol, or compromises public health and safety.

**Availability of Resources:** Refuge support for research may take the form of funding in-kind services such as housing; the use of other refuge facilities, vehicles, boats, or equipment; the management treatments; or providing other assistance as appropriate. Generally, however, we incur the bulk of the cost for research in staff time to review research proposals, coordinate with researchers, and write special use permits. In some cases, a research project may require only a few hours of staff time to review the proposal, coordinate with other reviewers, and write a special use permit.

For projects conducted entirely by non-Service researchers, the following staff resources would be typical: proposal review, coordination, and special use permit preparation (refuge manager, 2 hours \$101.57; assistant manager 2 hours \$ 93.64; wildlife refuge specialist 8 hours \$197.20; Total: \$455.77).

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**Anticipated Impacts of the Use:** There may be short-term disturbance to plants and wildlife during field investigations, but this is unavoidable in most cases. We will conduct Intra-Service Section 7 Biological Evaluations for any proposal that could be anticipated to have an impact on any federally threatened or endangered species. We will ensure that the refuge or any non-Service researchers obtain any special permits, including collection and banding permits, required by state or federal law prior to issuing a special use permit.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** We will require all researchers to submit a detailed research proposal that follows Service Policy (Refuge Manual 4 RM 6). Researchers must give us at least 45 days to review proposals before the research begins. If the research involves the collection of wildlife, the refuge must be given 60 days to review the proposal. Researchers must obtain all necessary scientific collecting or other permits before starting the research. We will prioritize and approve proposals based on the need, benefit, compatibility, and funding required for the research.

We require researchers to submit a final report to the refuge upon completing their work. For long-term studies, we may also require interim progress reports. We also expect that research will be published in peer-reviewed publications, all reports, presentations, and posters. Articles or other publications will acknowledge the National Wildlife Refuge System and Bond Swamp National Wildlife Refuge as partners in the research.

**Justification:** The Service encourages research on national wildlife refuges to promote new information which will improve the quality of the refuge and other Service management decisions, to expand the body of scientific knowledge about fish and wildlife resources, and to provide opportunities for students and others to learn the principles of field research.

In accordance with 50 CFR 26.41, research conducted by non-Services personnel, as described in this compatibility determination, will not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes for which the refuge was established.

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**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement  
 Categorical Exclusion and Environmental Action Statement  
 Environmental Assessment and Finding of No Significant Impact  
 Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date:** 09/24/2019

**Description of Use: Walking, Jogging, and Bicycling**

Walking, jogging, and bicycling are all activities currently open to the public on the refuge. These activities are not necessarily wildlife-dependent recreation, but can be used in support of wildlife observation, photography, and environmental education. These activities would require the maintenance of existing trails and roads.

Walking and jogging activities primarily would occur on established foot trails. However, walking and jogging would be allowed anywhere on the refuge that is not marked as closed. Bicycling would be limited to refuge roads that are open to vehicles. Currently, most of the bicycle use occurs on county roads passing through the refuge. Bicycles would not be permitted on foot trails or through the woods. The refuge would be open for walking, jogging, and bicycling during daylight hours. These activities would be conducted year-round except when closed during big game firearm hunts. An active refuge law enforcement program would ensure regulation compliance and protect refuge resources.

**Availability of Resources:** Funding for these programs is borne by annual operation and maintenance funds, which include activities involving the public such as recreation, interpretation, environmental education, and conduct of refuge hunting and fishing programs. The station has adequate resources to cover the cost of the proposed use. No special equipment, facilities, or improvements are needed to support the use. Maintenance of existing facilities would include mowing road sides and maintaining signs, kiosks, and designated hiking trails. These facilities are maintained for refuge management and other public use activities on the refuge. No monitoring costs are anticipated.

**Anticipated Impacts of the Use:** Short-term impacts: Walking, jogging, and bicycling as proposed would not impact the refuge mission or management activities. The activities would cause some temporary disturbance to wildlife from noise and trampling of vegetation. The impact would be short in duration and limited in scope. As proposed, these activities would have minimum impact on refuge resources. Disturbance to wildlife from the current levels of walking, jogging, and bicycling is not known to be a problem.

Long-term impacts: The primary biological impact from walking, jogging, and bicycling as proposed would be the temporary disturbance to wildlife from sight and sounds. Some possible long-term effects of disturbance to wildlife from recreational activities are: reducing productivity; causing abandonment or altering of breeding territories; altering distribution; altering flight behavior; causing energy depletion; and disrupting nest and brood rearing attentiveness (Klein 1989 and Knight et al. 1988). Since these activities occur at minimal levels and are short in duration, any disturbance of wildlife is expected to be minimal.

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Cumulative impacts: Since these activities occur at minimal levels and are short in duration, any disturbance of wildlife is expected to be minimal. There is no indication that the current level of disturbance would create any long-term problems.

**Public Review and Comment:** This compatibility determination is provided for public review and comment during the review of the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bond Swamp National Wildlife Refuge (NWR). The notice of availability for a 30-day public review of the Bond Swamp NWR's Draft CCP/EA was published in the *Federal Register* on June 22, 2009. All 699 individuals on the CCP mailing list were notified by postal mail or e-mail of the upcoming public review period. The Service sent the Draft CCP/EA to the 46 individuals who requested a paper copy or copy on compact disk. The Draft CCP/EA was also available for review from the Internet. The Service sent the Draft CCP/EA to Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Alabama-Quassarte Tribal Town, Poarch Band of Creek Indians of Alabama, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, the Georgia Department of Natural Resources, and the Georgia Clearinghouse for state agency review. A news release was posted on the Georgia Outdoor News website on July 16, 2009. WMGT Channel 41 in Macon ran a segment on the Draft CCP/EA public comment period on the evening news on July 21, 2009, at 6 p.m. and 10 p.m. Additionally, the availability of the Draft CCP/EA was posted at the refuge visitor center. There were no comments received specific to the compatibility determinations.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Some areas on the refuge may be closed to avoid user conflicts and conflicts with other management programs such as waterfowl management. Areas closed to public use will be posted and patrolled.

An active refuge law enforcement program will ensure regulation compliance and will protect refuge resources and the public.

Field interpretive services will help educate visitors on the disturbance effects of the use.

Vehicle or bicycle use will be limited to regularly maintained roads open to vehicle use. Some roads will be closed during periods of other uses.

**Justification:** Recreational foot travel and bicycling as proposed are compatible with the purposes for which Bond Swamp National Wildlife Refuge was established. The 1939 executive order states that any activity on the refuge, which disturbs wildlife, will be controlled by special regulations. These uses are currently being allowed and have been for a long time. The primary purpose for allowing walking, jogging, and bicycling is to provide the public with additional recreational opportunity to observe wildlife and to enjoy non-urban environments. The use is biologically sound. Walking, jogging, and bicycling at the levels found on the refuge do not cause negative impacts to wildlife and help develop appreciation for the refuge and its resources.

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**NEPA Compliance for Refuge Use Description:** *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**Mandatory 10-year Re-evaluation Date: 09/24/2019**

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**Literature Cited:**

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## Approval of Compatibility Determinations

The signature of approval is for all compatibility determinations considered within the Comprehensive Conservation Plan for Bond Swamp National Wildlife Refuge. 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: **Signed**  8/27/09  
(Signature/Date)

Regional Compatibility Coordinator: **Signed**  8/19/09  
(Signature/Date)

Refuge Supervisor: **Signed**  9/14/09  
(Signature/Date)

Regional Chief, National Wildlife Refuge System, Southeast Region: **Signed**  9-18-09  
(Signature/Date)

# Appendix G. Intra-Service Section 7 Biological Evaluation

## REGION 4 INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

**Originating Person:** Carolyn Johnson, Assistant Refuge Manager  
**Telephone Number:** 478-986-5441 **E-Mail:** Carolyn\_Johnson@fws.gov  
**Date:** April 10, 2009

**PROJECT NAME:** Bond Swamp NWR's 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:** Georgia/U.S. Fish and Wildlife Service

**III. Station Name:** Bond Swamp National Wildlife Refuge

**IV. Description of Proposed Action:** Implement the Comprehensive Conservation Plan for Bond Swamp NWR by adopting the proposed alternative. This plan directs the management of the refuge for the next 15 years.

**V. Pertinent Species and Habitat:**

- Include species/habitat occurrence map:
- Complete the following table:

SPECIES/CRITICAL HABITAT	STATUS <sup>1</sup>
Wood stork ( <i>Mycteria americana</i> )	E
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	E
Relict trillium ( <i>Trillium reliquum</i> )	E
Fringed campion ( <i>Silene polypetala</i> )	E

<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:**

- **Ecoregion Number and Name:** Ecosystem 31 - Altamaha Ecosystem  
**County and State:** Bibb and Twiggs Counties, Georgia
- **Section, township, and range:**  
Macon East and Warner Robins NE Quadrangle (7.5 minute series), Georgia.

**D. Distance and direction to nearest town:** 7 miles south of Macon, Georgia.

**E. Species/habitat occurrence:**

Wood storks may occasionally use the open wetland habitats for post-breeding foraging. Shortnose sturgeon can be found in the Ocmulgee River system. Relict trillium and fringed campion may have suitable habitat on the refuge although their presence has not been documented to date.

**VII. Determination of Effects:**

Explanation of effects of the action on species and critical habitats in item V.B:

SPECIES/CRITICAL HABITAT	EFFECTS OF THE ACTION ON SPECIES/CRITICAL HABITAT <sup>1</sup>
Wood stork ( <i>Mycteria americana</i> )	The hydrology of the area governs the wetlands on the refuge and thus, the potential use patterns of the wood stork. The plan strives to protect and enhance wetlands. Proposed public use levels should not impact this species. The area is not used for nesting and only occasional sightings are observed in the area each year.
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	The plan strives to protect and enhance wetlands on the refuge. Working with partners to monitor water parameters will enhance understanding of threats to river system.
Relict trillium ( <i>Trillium reliquum</i> ) Fringed campion ( <i>Silene polypetala</i> )	Enhanced monitoring efforts to identify potential habitat and possibly locate these species will enhance protection efforts.

<sup>1</sup>DEFINITIONS FOR EFFECTS OF THE ACTION:

*Direct Effects - those that are an immediate result of the action.*

*Indirect Effects - those caused by the action later in time but are still reasonably certain to occur. They include the effects of future activities that are induced by the original action and that occur after the action is completed.*

*Interrelated - those that are part of a larger action and depend on the larger action for their justification.*

*Interdependent - those that have no significant effect independent utility apart from the action under consideration.*

*Cumulative Effects - the effects of state or private activities, not involving federal activities, that are reasonably certain to occur within the action area.*

**B. Explanation of Actions to be Implemented to Reduce Adverse Effects:**

SPECIES/CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE EFFECTS
Wood stork ( <i>Mycteria americana</i> )	Increased surveys of aquatic parameters may increase detection of impacts to the system from outside sources. Understanding the distribution and use patterns of these animals may help in protecting the species from impacts. Enhancement of wetlands may increase foraging activity. The refuge will minimize human disturbance to any indentified foraging areas.
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	Increased surveys of aquatic parameters may increase detection of impacts to the system from outside sources.
Relict trillium ( <i>Trillium reliquum</i> )	Implementation of surveys to locate potential habitat may increase detection of species.
Fringed campion ( <i>Silene polypetala</i> )	Implementation of surveys to locate potential habitat may increase detection of species.

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

SPECIES/ CRITICAL HABITAT	DETERMINATION <sup>1</sup>			RESPONSE REQUESTED
	NE	NA	AA	
Wood stork ( <i>Mycteria americana</i> )	X			concurrence
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	X			concurrence
Relict trillium ( <i>Trillium reliquum</i> )	X			concurrence
Fringed campion ( <i>Silene polypetala</i> )	X			concurrence

<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".

**Signed** \_\_\_\_\_  
Signature 8-27-09  
\_\_\_\_\_ date  
Refuge Manager  
Title

**IX. Reviewing Ecological Services Office Evaluation:**

- A. Concurrence  Nonconcurrence \_\_\_\_\_
- B. Formal consultation required \_\_\_\_\_
- C. Conference required \_\_\_\_\_
- D. Informal conference required \_\_\_\_\_
- E. Remarks:

**Signed** \_\_\_\_\_  
signature 8/25/09  
\_\_\_\_\_ date  
Field Supervisor Georgia Ecological Services  
title office

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## *Appendix H. Wilderness Review*

The Wilderness Act of 1964 defines a wilderness area as an area of federal land that retains its primeval character and influence, without permanent improvements or human inhabitation, and is managed so as to preserve its natural conditions and which:

1. generally appears to have been influenced 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 types 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 unimpeded condition; or is a roadless island, regardless of size;
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; and
5. may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The lands within Bond Swamp National Wildlife Refuge were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964.

No lands in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this plan.





## Appendix I. Refuge Biota

### BIRDS

GREBES	Sp	S	F	W
Pied-billed Grebe ( <i>Podilymbus podiceps</i> )	-	-	-	R
Horned Grebe ( <i>Podiceps auritus</i> )	O	O	O	O
CORMORANTS AND DARTERS	Sp	S	F	W
Double Crested Cormorant ( <i>Phalacrocorax auritus</i> )	-	R	O	O
*Anhinga ( <i>Anhinga anhinga</i> )	O	O	-	-
BITTERNs, HERONS, IBISES AND STORKS	Sp	S	F	W
American Bittern ( <i>Botaurus lentiginosus</i> )	O	O	-	-
Least Bittern ( <i>Ixobrychus exilis</i> )	O	O	-	-
*Great Blue Heron ( <i>Ardea herodias</i> )	O	O	O	O
*Great Egret ( <i>Ardea alba</i> )	O	O	O	O
Snowy Egret ( <i>Egretta thula</i> )	R	R	-	-
*Little Blue Heron ( <i>Egretta caerulea</i> )	O	O	O	O
Tricolored Heron ( <i>Egretta tricolor</i> )	O	O	O	O
Cattle Egret ( <i>Bubulcus ibis</i> )	-	O	-	-
*Green Heron ( <i>Butorides striatus</i> )	O	O	O	-
Black-crowned Night Heron ( <i>Nyctanassa nycticorax</i> )	-	O	O	-
Yellow-crowned Night Heron ( <i>Nyctanassa violacea</i> )	-	O	O	-
White Ibis ( <i>Eudocimus albus</i> )	U	U	O	-
●Wood Stork ( <i>Mycteria americana</i> )	R	-	-	-
GEESE AND DUCKS	Sp	S	F	W
Canada Goose ( <i>Branta canadensis</i> )	-	-	-	U
*Wood Duck ( <i>Aix sponsa</i> )	C	C	C	C
Green-winged Teal ( <i>Anas crecca</i> )	-	-	O	O
American Black Duck ( <i>Anas rubripes</i> )	-	-	C	C
*Mallard ( <i>Anas platyrhynchos</i> )	C	O	C	C
Northern Pintail ( <i>Anas acuta</i> )	-	-	O	O
Blue-winged Teal ( <i>Anas discors</i> )	-	-	O	O
Northern Shoveler ( <i>Anas clypeata</i> )	U	-	O	O
Gadwall ( <i>Anas strepera</i> )	-	-	O	O
American Wigeon ( <i>Anas americana</i> )	U	-	O	O
Canvasback ( <i>Aythya valisineria</i> )	R	-	U	U
Redhead ( <i>Aythya americana</i> )	R	-	U	U
Ring-necked Duck ( <i>Aythya collaris</i> )	C	-	C	C
Lesser Scaup ( <i>Aythya affinis</i> )	C	-	C	C
Common Goldeneye ( <i>Bucephala clangula</i> )	R	-	R	R
Bufflehead ( <i>Bucephala albeola</i> )	U	-	O	O
Hooded Merganser ( <i>Lophodytes cucullatus</i> )	U	R	O	C

Red-breasted Merganser ( <i>Mergus serrator</i> )	R	-	R	U
Ruddy Duck ( <i>Oxyura jamaicensis</i> )	U	-	O	O
<hr/>				
VULTURES, HAWKS AND ALLIES	Sp	S	F	W
*Black Vulture ( <i>Coragyps atratus</i> )	C	C	C	C
*Turkey Vulture ( <i>Cathartes aura</i> )	C	C	C	C
*Osprey ( <i>Pandion haliaetus</i> )	O	U	O	O
Swallow-tailed Kite ( <i>Elanoides forficatus</i> )	R	R	-	-
*Mississippi Kite ( <i>Ictinia mississippiensis</i> )	U	U	-	-
*Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	O	U	O	O
Northern Harrier ( <i>Circus cyaneus</i> )	U	-	O	O
Sharp-shinned Hawk ( <i>Accipiter striatus</i> )	U	-	O	O
*Cooper's Hawk ( <i>Accipiter cooperii</i> )	U	R	U	U
*Red-shouldered Hawk ( <i>Buteo lineatus</i> )	C	O	C	C
Broad-winged Hawk ( <i>Buteo platypterus</i> )	R	U	R	-
*Red-tailed Hawk ( <i>Buteo jamaicensis</i> )	C	O	C	C
American Kestrel ( <i>Falco sparverius</i> )	C	R	O	C
Merlin ( <i>Falco columbarius</i> )	-	-	-	R
Peregrine Falcon ( <i>Falco peregrinus</i> )	-	-	-	R
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TURKEYS AND QUAIL	Sp	S	F	W
*Wild Turkey ( <i>Meleagris gallopavo</i> )	O	O	O	O
*Northern Bobwhite ( <i>Colinus virginianus</i> )	O	O	O	O
<hr/>				
RAILS, GALLINULES, COOTS AND CRANES	Sp	S	F	W
Black Rail ( <i>Laterallus jamaicensis</i> )	-	R	-	-
King Rail ( <i>Rallus elegans</i> )	O	O	-	-
Virginia Rail ( <i>Rallus limicola</i> )	O	-	-	O
Sora ( <i>Porzana carolina</i> )	-	U	-	-
Common Moorhen ( <i>Gallinula chloropus</i> )	-	-	-	R
American Coot ( <i>Fulica americana</i> )	O	-	C	C
Sandhill Crane ( <i>Grus canadensis</i> )	U	-	U	U
<hr/>				
SHOREBIRDS	Sp	S	F	W
*Killdeer ( <i>Charadrius vociferous</i> )	O	O	O	O
Spotted Sandpiper ( <i>Actitis macularia</i> )	O	U	O	O
Common Snipe ( <i>Gallinago gallinago</i> )	U	-	U	U
*American Woodcock ( <i>Scolopax minor</i> )	O	O	O	O
Ring-billed Gull ( <i>Larus delawarensis</i> )	R	-	R	R
Herring Gull ( <i>Larus argentatus</i> )	R	-	R	-
Black Tern ( <i>Chlidonias niger</i> )	-	-	R	-
<hr/>				
PIGEONS AND DOVES	Sp	S	F	W
*Rock Dove ( <i>Columba livia</i> )	O	O	O	O
*Mourning Dove ( <i>Zenaida macroura</i> )	C	C	C	C
*Common Ground-Dove ( <i>Columbina passerina</i> )	U	U	U	U

CUCKOOS	Sp	S	F	W
Black-billed Cuckoo ( <i>Coccyzus erythrophthalmus</i> )	R	-	R	-
*Yellow-billed Cuckoo ( <i>Coccyzus americanus</i> )	C	C	C	O
OWLS	Sp	S	F	W
*Barn Owl ( <i>Tyto alba</i> )	U	U	U	U
*Eastern Screech-Owl ( <i>Megascops asio</i> )	O	O	O	O
*Great Horned Owl ( <i>Bubo virginianus</i> )	O	O	O	O
*Barred Owl ( <i>Strix varia</i> )	O	O	O	C
GOATSUCKERS AND NIGHTJARS	Sp	S	F	W
*Common Nighthawk ( <i>Chordeiles minor</i> )	O	C	-	-
*Chuck-will's-widow ( <i>Caprimulgus carolinensis</i> )	O	C	-	-
*Whip-poor-will ( <i>Caprimulgus vociferus</i> )	O	C	O	-
SWIFTS, HUMMINGBIRDS	Sp	S	F	W
*Chimney Swift ( <i>Chaetura pelagica</i> )	C	C	C	-
*Ruby-throated Hummingbird ( <i>Archilochus colubris</i> )	O	O	O	-
KINGFISHERS	Sp	S	F	W
*Belted Kingfisher ( <i>Megaceryle alcyon</i> )	C	C	C	C
WOODPECKERS	Sp	S	F	W
*Red-headed Woodpecker ( <i>Melanerpes erythrocephalus</i> )	C	C	C	C
*Red-bellied Woodpecker ( <i>Melanerpes carolinus</i> )	C	C	C	C
Yellow-bellied Sapsucker ( <i>Sphyrapicus varius</i> )	O	-	O	O
*Downy Woodpecker ( <i>Picoides pubescens</i> )	C	C	C	C
*Hairy Woodpecker ( <i>Picoides villosus</i> )	O	O	O	O
*Northern Flicker ( <i>Colaptes auratus</i> )	C	C	C	C
*Pileated Woodpecker ( <i>Dryocopus pileatus</i> )	C	C	C	C
FLYCATCHERS	Sp	S	F	W
*Eastern Wood-Pewee ( <i>Contopus virens</i> )	-	C	C	C
Yellow-bellied Flycatcher ( <i>Empidonax flaviventris</i> )	-	R	-	R
*Acadian Flycatcher ( <i>Empidonax virescens</i> )	C	C	C	-
Least Flycatcher ( <i>Empidonax minimus</i> )	U	-	U	-
*Eastern Phoebe ( <i>Sayornis phoebe</i> )	C	-	C	C
*Great Crested Flycatcher ( <i>Myiarchus crinitus</i> )	C	C	C	-
*Eastern Kingbird ( <i>Tyrannus tyrannus</i> )	C	C	C	-
SHRIKES	Sp	S	F	W
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	U	U	U	U

MARTINS AND SWALLOWS	Sp	S	F	W
*Purple Martin ( <i>Progne subis</i> )	O	O	O	-
Tree Swallow ( <i>Tachycineta bicolor</i> )	U	U	R	R
*Northern Rough-winged Swallow ( <i>Stelgidopteryx serripennis</i> )	O	O	U	U
Bank Swallow ( <i>Hirundo rustica</i> )	U	-	U	-
Cliff Swallow ( <i>Hirundo pyrrhonota</i> )	O	O	O	-
*Barn Swallow ( <i>Hirundo rustica</i> )	O	O	U	-
VIREOS	Sp	S	F	W
*White-eyed Vireo ( <i>Vireo griseus</i> )	C	C	C	R
*Blue-headed Vireo ( <i>Vireo solitarius</i> )	O	R	O	O
*Yellow-throated Vireo ( <i>Vireo flavifrons</i> )	-	C	C	C
Philadelphia Vireo ( <i>Vireo philadelphicus</i> )	R	-	R	-
*Red-eyed Vireo ( <i>Vireo olivaceus</i> )	C	C	C	-
JAYS AND CROWS	Sp	S	F	W
*Blue Jay ( <i>Cyanocitta cristata</i> )	C	C	C	C
*American Crow ( <i>Corvus brachyrhynchos</i> )	C	C	C	C
Fish Crow ( <i>Corvus ossifragus</i> )	U	R	C	C
CHICKADEES AND TITMICE	Sp	S	F	W
*Carolina Chickadee ( <i>Parus carolinensis</i> )	C	C	C	C
*Tufted Titmouse ( <i>Parus bicolor</i> )	C	C	C	C
NUTHATCHES AND CREEPERS	Sp	S	F	W
Red-breasted Nuthatch ( <i>Sitta canadensis</i> )	-	-	R	R
*White-breasted Nuthatch ( <i>Sitta carolinensis</i> )	O	O	O	O
*Brown-headed Nuthatch ( <i>Sitta pusilla</i> )	C	C	C	C
Brown Creeper ( <i>Certhia americana</i> )	U	-	U	U
WRENS	Sp	S	F	W
*Carolina Wren ( <i>Thryothorus ludovicianus</i> )	C	C	C	C
House Wren ( <i>Troglodytes aedon</i> )	R	-	U	U
Winter Wren ( <i>Troglodytes troglodytes</i> )	-	-	-	U
Sedge Wren ( <i>Cistothorus platensis</i> )	-	-	-	R
Marsh Wren ( <i>Cistothorus palustris</i> )	-	-	-	R
GNATCATCHERS, KINGLETS AND THRUSHES	Sp	S	F	W
Golden-crowned Kinglet ( <i>Regulus satrapa</i> )	U	-	U	C
Ruby-crowned Kinglet ( <i>Regulus calendula</i> )	O	-	O	C
*Blue-gray Gnatcatcher ( <i>Polioptila caerulea</i> )	C	C	C	O
*Eastern Bluebird ( <i>Sialia sialis</i> )	C	C	C	C

Veery ( <i>Catharus fuscescens</i> )	O	-	O	-
Gray-cheeked Thrush ( <i>Catharus minimus</i> )	U	-	U	-
Swainson's Thrush ( <i>Catharus ustulatus</i> )	O	-	O	-
Hermit Thrush ( <i>Catharus guttatus</i> )	U	-	U	C
*Wood Thrush ( <i>Hylocichla mustelina</i> )	C	C	C	-
*American Robin ( <i>Turdus migratorius</i> )	C	C	C	C
<hr/>				
MOCKINGBIRDS AND THRASHERS	Sp	S	F	W
*Gray Catbird ( <i>Dumetella carolinensis</i> )	O	O	O	U
*Northern Mockingbird ( <i>Mimus polyglottos</i> )	C	C	C	C
*Brown Thrasher ( <i>Toxostoma rufum</i> )	C	C	C	C
<hr/>				
PIPITS	Sp	S	F	W
American Pipit ( <i>Anthus rubescens</i> )	U	-	U	U
<hr/>				
WAXWINGS	Sp	S	F	W
Cedar Waxwing ( <i>Bombycilla cedrorum</i> )	U	-	U	O
<hr/>				
STARLINGS	Sp	S	F	W
*European Starling ( <i>Sturnus vulgaris</i> )	C	C	C	C
<hr/>				
WARBLERS	Sp	S	F	W
Blue-winged Warbler ( <i>Vermivora pinus</i> )	U	-	U	-
Golden-winged Warbler ( <i>Vermivora chrysoptera</i> )	-	U	-	U
Tennessee Warbler ( <i>Vermivora peregrina</i> )	U	-	U	-
Orange-crowned Warbler ( <i>Vermivora celata</i> )	-	-	U	O
Nashville Warbler ( <i>Vermivora ruficapilla</i> )	-	-	r	-
*Northern Parula ( <i>Parula americana</i> )	C	C	C	-
Yellow Warbler ( <i>Dendroica petechia</i> )	U	-	U	-
Chestnut-sided Warbler ( <i>Dendroica pensylvanica</i> )	-	U	-	U
Magnolia Warbler ( <i>Dendroica magnolia</i> )	U	-	U	-
Cape May Warbler ( <i>Dendroica tigrina</i> )	R	-	R	-
Black-throated Blue Warbler ( <i>Dendroica caerulescens</i> )	-	U	-	U
Yellow-rumped Warbler ( <i>Dendroica coronata</i> )	C	-	C	C
Black-throated Green Warbler ( <i>Dendroica virens</i> )	O	-	O	-
Blackburnian Warbler ( <i>Dendroica fusca</i> )	U	-	U	-
*Yellow-throated Warbler ( <i>Dendroica dominica</i> )	O	O	O	U
*Pine Warbler ( <i>Dendroica pinus</i> )	C	C	C	C
*Prairie Warbler ( <i>Dendroica discolor</i> )	C	C	C	-
Bay-breasted Warbler ( <i>Dendroica castanea</i> )	-	R	-	R
Palm Warbler ( <i>Dendroica palmarum</i> )	O	-	O	U
Blackpoll Warbler ( <i>Dendroica striata</i> )	U	-	-	-
Cerulean Warbler ( <i>Dendroica cerulea</i> )	R	-	R	-
*Black-and-white Warbler ( <i>Mniotilta varia</i> )	O	O	O	R
*American Redstart ( <i>Setophaga ruticilla</i> )	C	U	C	-

*Prothonotary Warbler ( <i>Protonotaria citrea</i> )	C	C	C	-
Worm-eating Warbler ( <i>Helmitheros vermivorus</i> )	O	-	O	-
Swainson's Warbler ( <i>Limnothlypis swainsonii</i> )	O	O	O	-
Ovenbird ( <i>Seiurus aurocapilla</i> )	U	-	U	-
Northern Waterthrush ( <i>Seiurus noveboracensis</i> )	U	-	U	-
*Louisiana Waterthrush ( <i>Seiurus motacilla</i> )	O	U	O	-
*Kentucky Warbler ( <i>Oporornis formosus</i> )	C	C	C	-
*Common Yellowthroat ( <i>Geothlypos trichas</i> )	C	C	C	C
*Hooded Warbler ( <i>Wilsonia citrine</i> )	C	C	C	-
Wilson's Warbler ( <i>Wilsonia pusilla</i> )	-	-	R	-
Canada Warbler ( <i>Wilsonia Canadensis</i> )	-	-	R	-
Yellow-breasted Chat* ( <i>Icteria virens</i> )	u	u	u	-
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TANAGERS	Sp	S	F	W
*Summer Tanager ( <i>Piranga rubra</i> )	C	C	C	-
Scarlet Tanager ( <i>Piranga olivacea</i> )	U	-	U	-
<hr/>				
GROSBEAKS, SPARROWS, BUNTINGS	Sp	S	F	W
*Northern Cardinal ( <i>Cardinalis cardinalis</i> )	C	C	C	C
Rose-breasted Grosbeak ( <i>Pheucticus ludovicianus</i> )	U	-	U	-
*Blue Grosbeak ( <i>Passerina caerulea</i> )	O	O	O	-
*Indigo Bunting ( <i>Passerina cyanea</i> )	C	C	C	-
Painted Bunting ( <i>Passerina ciris</i> )	R	R	R	-
*Dickcissel ( <i>Spiza americana</i> )	R	R	R	-
Eastern Towhee ( <i>Pipilo erythrophthalmus</i> )	C	C	C	C
*Chipping Sparrow ( <i>Spizella passerine</i> )	C	C	C	C
*Field Sparrow ( <i>Spizella pusilla</i> )	C	C	C	C
Vesper Sparrow ( <i>Pooecetes gramineus</i> )	-	-	-	O
Savannah Sparrow ( <i>Passerculus sandwichensis</i> )	U	-	U	C
Fox Sparrow ( <i>Passerella iliaca</i> )	U	-	U	U
Song Sparrow ( <i>Melospiza melodia</i> )	C	-	C	C
Swamp Sparrow ( <i>Melospiza georgiana</i> )	C	-	C	C
White-throated Sparrow ( <i>Zonotrichia albicollis</i> )	C	-	C	C
White-crowned Sparrow ( <i>Zonotrichia leucophrys</i> )	R	-	R	R
Dark-eyed Junco ( <i>Junco hyemalis</i> )	C	-	C	C
Lincoln's Sparrow ( <i>Melospiza lincolni</i> )	R	-	-	-
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BLACKBIRDS AND ORIOLES	Sp	S	F	W
Bobolink ( <i>Dolichonyx oryzivorus</i> )	U	-	R	-
*Red-winged Blackbird ( <i>Agelaius phoeniceus</i> )	C	C	C	C
*Eastern Meadowlark ( <i>Sturnella magna</i> )	C	C	C	C
Rusty Blackbird ( <i>Euphagus carolinus</i> )	-	-	-	O
Brewer's Blackbird ( <i>Euphagus cyanocephalus</i> )	-	-	-	R
*Common Grackle ( <i>Quiscalus quiscula</i> )	C	C	C	C
*Brown-headed Cowbird ( <i>Molothrus ater</i> )	C	C	C	C
*Orchard Oriole ( <i>Icterus spurius</i> )	O	O	O	-
Baltimore Oriole ( <i>Icterus galbula</i> )	U	R	U	R

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FINCHES	Sp	S	F	W
Purple Finch ( <i>Carpodacus purpureus</i> )	U	-	U	U
*House Finch ( <i>Carpodacus mexicanus</i> )	C	C	C	C
Pine Siskin ( <i>Carduelis pinus</i> )	R	-	-	R
*American Goldfinch ( <i>Carduelis tristis</i> )	C	U	U	C
Evening Grosbeak ( <i>Coccothraustes vespertinus</i> )	R	-	-	R

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OLD WORLD SPARROWS	Sp	S	F	W
*House Sparrow ( <i>Passer domesticus</i> )	C	C	C	C

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### Seasonal appearance

Sp - Spring - March to May

S - Summer - June to August

F - Fall - September to November

W - Winter - December to February

### Seasonal abundance

C - common: certain to be seen in suitable habitat

U - uncommon: seen only a few times during a season

O - occasional: present but not certain to be seen

R - rare: known to be present but not every year

● - Endangered species

\* - Birds known to nest locally

Common Name	Scientific Name
<b>Mammals</b>	
Virginia Opossum	<i>Didelphis virginiana</i>
Southeastern Shrew	<i>Sorex longirostris</i>
Southern Short-tailed Shrew	<i>Blarina carolinensis</i>
Least Shrew	<i>Cryptotis parva</i>
Eastern Mole	<i>Scaolpus aquaticus</i>
Southeastern Myotis	<i>Myotis austroriparius</i>
Eastern Red Bat	<i>Lasiurus borealis</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Seminole Bat	<i>Lasiurus seminolus</i>
Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Evening Bat	<i>Nycticeius humeralis</i>
Brazilian Free-tailed Bat	<i>Tadarida brasiliensis</i>
Nine-banded Armadillo	<i>Dasypus novemcinctus</i>
Gray Squirrel	<i>Sciurus carolinensis</i>
Fox Squirrel	<i>Sciurus niger</i>
Southern Flying Squirrel	<i>Glaucomys volans</i>
Southeastern Pocket Gopher	<i>Geomys pinetis</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Eastern Cottontail	<i>Sylvilagus floridanus</i>
Swamp Rabbit "Cane Cutter"	<i>Sylvilagus aquaticus</i>
Marsh Rabbit	<i>Sylvilagus palustris</i>
Beaver	<i>Castor canadensis</i>
Marsh Rice Rat	<i>Oryzomys palustris</i>
Eastern Harvest Mouse	<i>Reithrodontomys humulis</i>
Cotton Mouse	<i>Peromyscus gossypinus</i>
Oldfield Mouse	<i>Peromyscus polionotus</i>
Golden Mouse	<i>Peromyscus nuttalli</i>
Cotton Rat	<i>Sigmodon hispidus</i>
Eastern Woodrat	<i>Neotoma floridana</i>



<b>Common Name</b>	<b>Scientific Name</b>
Woodland Vole	<i>Microtus pinetorum</i>
Norway Rat "Common Rat"	<i>Rattus norvegicus</i>
Black Rat	<i>Rattus rat</i>
House Mouse	<i>Mus musculus</i>
River Otter	<i>Lutra Canadensis</i>
Common Muskrat	<i>Ondatra zibethicus</i>
Mink	<i>Mustela vison</i>
Raccoon	<i>Procyon lotor</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Striped Skunk	<i>Mephitis mephitis</i>
Eastern Spotted Skunk	<i>Spilogale putorius</i>
Nutria	<i>Myocastor coypus</i>
Coyote	<i>Canis latrans</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Red Fox	<i>Vulpes vulpes</i>
Bobcat	<i>Lynx rufus</i>
Black Bear	<i>Ursus americanus</i>
White-Tailed Deer	<i>Odocoileus virginianus</i>
Feral Pig	<i>Sus scrofa</i>
<b>Reptiles</b>	
Red-Bellied Water Snake	<i>Nerodia erythrogaster</i>
Brown Water Snake	<i>Nerodia taxispilota</i>
Midland Water Snake	<i>Nerodia sipedon</i>
Banded Water Snake	<i>Nerodia fasciata</i>
Queen Snake	<i>Regina septemvittata</i>
Brown Snake	<i>Storeria dekayi</i>
Red-Bellied Snake	<i>Storeria occipitomaculata</i>
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>
Eastern Garter Snake	<i>Thamnophis sirtalis</i>
Smooth Earth Snake	<i>Virginia valeriae</i>
Rough Earth Snake	<i>Virginia striatula</i>
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>

<b>Common Name</b>	<b>Scientific Name</b>
Southern Ringneck Snake	<i>Diadophis punctatus</i>
Mud Snake	<i>Farancia abacura</i>
Southern Black Racer	<i>Coluber constrictor priapus</i>
Eastern Coachwhip	<i>Masticophis flagellum</i>
Rough Green Snake	<i>Opheodrys aestivus</i>
Black Rat Snake	<i>Elaphe obsoleta</i>
Corn Snake	<i>Elaphe guttata</i>
Eastern Kingsnake	<i>Lampropeltis getulus</i>
Scarlet Kingsnake	<i>Lampropeltis triangulum</i>
Scarlet Snake	<i>Cemophora coccinea</i>
Southeastern Crowned Snake	<i>Tantilla coronata</i>
Eastern Cottonmouth	<i>Agkistrodon piscivorus</i>
Copperhead	<i>Agkistrodon contortrix</i>
Timber Rattlesnake	<i>Crotalus horridus</i>
Eastern Fence Lizard	<i>Sceloporus undulatus</i>
Green Anole	<i>Anolis carolinensis</i>
Mole Skink	<i>Eumeces egregius</i>
Five-Lined Skink	<i>Eumeces fasciatus</i>
Southeastern Five-Lined Skink	<i>Eumeces inexpectatus</i>
Broad-headed Skink	<i>Eumeces laticeps</i>
Six-Lined Racerunner	<i>Cnemidophorus sexlineatus</i>
Eastern Glass Lizard	<i>Ophisaurus ventralis</i>
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>
Ground Skink	<i>Scincella lateralis</i>
Eastern Box Turtle	<i>Terrapene carolina</i>
Common Musk Turtle	<i>Sternotherus odoratus</i>
Loggerhead Musk Turtle	<i>Sternotherus minor</i>
Striped Mud Turtle	<i>Kinosternon baurii</i>
Spotted Turtle	<i>Clemmys guttata</i>
River Cooter	<i>Pseudemys concinna</i>
Florida Cooter	<i>Pseudemys floridana</i>
Spiny Softshell Turtle	<i>Apalone spinifera</i>

<b>Common Name</b>	<b>Scientific Name</b>
Snapping Turtle	<i>Chelydra serpentina</i>
Alligator Snapping Turtle	<i>Macroclemys temmincki</i>
Yellow-bellied Slider	<i>Trachemys scripta</i>
American Alligator	<i>Alligator mississippiensis</i>
<b>Amphibians</b>	
American Toad	<i>Bufo americanus</i>
Fowler's Toad	<i>Bufo fowleri</i>
Southern Toad	<i>Bufo terrestris</i>
Eastern Spadefoot	<i>Scaphiopus holbrookii</i>
Squirrel Treefrog	<i>Hyla squirella</i>
Bird-voiced Treefrog	<i>Hyla avivoca</i>
Green Treefrog	<i>Hyla cinerea</i>
Barking Treefrog	<i>Hyla gratiosa</i>
Gray Treefrog	<i>Hyla chrysoscelis</i>
Spring Peeper	<i>Hyla crucifer</i>
Northern Cricket Frog	<i>Acris crepitans</i>
Southern Cricket Frog	<i>Acris gryllus</i>
Southern Chorus Frog	<i>Pseudacris nigrita</i>
Upland Chorus Frog	<i>Pseudacris feriarum</i>
Bullfrog	<i>Rana catesbeiana</i>
Bronze Frog	<i>Rana clamitans</i>
Southern Leopard Frog	<i>Rana utricularia</i>
Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>
Lesser Siren	<i>Siren intermedia</i>
Two-toed Amphiuma	<i>Amphiuma means</i>
Spotted Salamander	<i>Ambystoma maculatum</i>
Marbled Salamander	<i>Ambystoma opacum</i>
Mole Salamander	<i>Ambystoma talpoideum</i>
Slimy Salamander	<i>Plethodon glutinosus</i>
Spotted Dusky Salamander	<i>Desmognathus conanti</i>
Southern Two-Lined Salamander	<i>Eurycea cirrigera</i>
Three-Lined Salamander	<i>Eurycea guttolineata</i>

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<b>Common Name</b>	<b>Scientific Name</b>
Dwarf Salamander	<i>Eurycea quadridigitata</i>
Red-Spotted Newt	<i>Notophthalmus viridescens</i>
Red Salamander	<i>Psuedotriton ruber</i>
Mud Salamander	<i>Psuedotriton montanus</i>

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## *Appendix J. List of Preparers*

**Greg Balkcom, Georgia DNR,**

Wildlife Resources Division – *Participant in Alternatives, Goals, Objectives Workshop*

**Bobby Bond, Georgia DNR,**

Wildlife Resources Division – *Participant in Alternatives, Goals, Objectives Workshop*

**Styron Bell, Refuge Operations Specialist,**

U.S. Fish and Wildlife Service, Bond Swamp National Wildlife Refuge – *Participant in Alternatives, Goals, Objectives Workshop*

**Andrew Hammond, Refuge Manager,**

U.S. Fish and Wildlife Service, Piedmont and Bond Swamp National Wildlife Refuges – *Participant in Alternatives, Goals, Objectives Workshop; CCP editor*

**Rose Hopp, Branch Chief, Planning,**

U.S. Fish and Wildlife Service, Southeast Region – *Participant in Alternatives, Goals, Objectives Workshop*

**Carolyn Johnson, Assistant Refuge Manager,**

U.S. Fish and Wildlife Service, Piedmont and Bond Swamp National Wildlife Refuges – *Overall project guidance and oversight; CCP editor*

**Leon Kolankiewicz, Environmental Planner/Biologist,**

Mangi Environmental Group – *Facilitated alternatives, goals, objectives workshop*

**Eveline Martin, Environmental Analyst/Biologist,**

Mangi Environmental Group – *Participant in Alternatives, Goals, Objectives Workshop, and CCP writer/editor;*

**Thomas Payne, Law Enforcement Officer,**

U.S. Fish and Wildlife Service, Piedmont and Bond Swamp National Wildlife Refuges – *Participant in Alternatives, Goals, Objectives Workshop*

**Carl Schmidt, Forester,**

U.S. Fish and Wildlife Service, Piedmont and Bond Swamp National Wildlife Refuges – *Participant in Alternatives, Goals, Objectives Workshop*

**Randy Williams, Project Manager/Planner,**

Mangi Environmental Group – *Planning team facilitator and CCP editor*



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## Appendix K. Consultation and Coordination

### OVERVIEW

The CCP for Bond Swamp NWR was written with the participation and assistance of refuge and Service staff, the Mangi Environmental Group (a contractor for the Service), and the Georgia DNR. The CCP planning process itself began in October 2006, with the formation of a refuge planning team; a notice of intent to prepare a CCP was published in the *Federal Register* in May 2007.

In July 2006, a team of biologists conducted a comprehensive biological review for the refuge. A Visitor Services Review was also conducted in 2006. Subsequently, the refuge hosted a public scoping meeting on July 10, 2007, and began an outreach campaign through various media to collect ideas and concerns from all stakeholders. Please see Chapter III of the CCP for more information on public scoping and overall consultation and coordination in plan development.

### CORE PLANNING TEAM MEMBERS

The core planning team consisted of the following:

Styron Bell – Refuge Operations Specialist  
Andrew Hammond – Refuge Manager  
Rose Hopp – Chief of Planning, Regional Office  
Carolyn Johnson – Assistant Refuge Manager  
Eveline Martin – Consultant, Mangi Environmental Group, Service Contractor  
Thomas Payne – Law Enforcement Officer  
Carl Schmidt – Administrative Forester  
Randy Williams – Consultant, Mangi Environmental Group, Service Contractor

### INTERDISCIPLINARY PLANNING TEAM MEMBERS

Several individuals supported the planning process with participation on the biological review team, visitor services review team, and additional special topic discussions. Their information provided additional biological support for developing objectives found in this CCP. Some members are internal to the Service and provide additional policy guidance and support for objective development as well.

### BIOLOGICAL REVIEW TEAM

Dean Demarest, Regional Office, Division of Migratory Birds  
Jeff Denman, White River NWR, St Charles, AR  
Stephen Earsom, Division of Refuges, Raleigh, NC  
Chuck Hunter, Regional Office, Division of Refuges  
John Jensen, Georgia DNR, Wildlife Resources Division, Nongame and Endangered Wildlife Program, Forsyth, GA  
Russ Langford, Okefenokee NWR, Folkston, GA  
Stefani Melvin, Regional Office, Division of Migratory Birds  
J. Michael Meyers, USGS Patuxent Wildlife Resources Center, University of Georgia, Athens, GA  
Nick Nicholson, Georgia DNR, Wildlife Resources Division, Social Circle, GA  
Jim Ozier, Georgia DNR, Wildlife Resources Division, Forsyth, GA  
Jerry Payne, USDA entomologist (retired) and Naturalist, Musella, GA

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Brian Rood, Mercer University, Department of Chemistry, Macon, GA

**VISITOR SERVICES REVIEW TEAM**

Garry Tucker, Regional Office, Visitor Services and Outreach

David Moody, St. Marks NWR, St. Marks, FL

Cindy Anderson, J.N. "Ding" Darling NWR, Sanibel, FL

**OTHER CONTRIBUTORS**

In addition to the above-listed core and extended planning team members, a number of individuals contributed to this CCP. These contributors participated in the scoping meeting or provided input at various stages of the planning process.

Greg Balkcom – Georgia DNR, Wildlife Resources Division

Bobby Bond – Georgia DNR, Wildlife Resources Division

Richard Kanaski – Regional Archaeologist, Southeast Region

Leon Kolankiewicz – Environmental Planner/Biologist, Mangi Environmental Group



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## *Appendix L. Finding of No Significant Impact*

### **Introduction**

The U.S. Fish and Wildlife Service proposes to protect and manage certain fish and wildlife resources in Bibb and Twiggs counties, Georgia, through the Bond Swamp National Wildlife Refuge (NWR). An environmental assessment was prepared to inform the public of the possible environmental consequences of implementing the Comprehensive Conservation Plan (CCP) for Bond Swamp NWR. A description of the alternatives, the rationale for selecting the preferred alternative, the environmental effects of the preferred alternative, the potential adverse effects of the action, and a declaration concerning the factors determining the significance of effects, in compliance with the National Environmental Policy Act of 1969, are outlined below. The supporting information can be found in the environmental assessment, which was Section B of the draft comprehensive conservation plan.

### **Alternatives**

In developing the CCP for Bond Swamp NWR, the Fish and Wildlife Service evaluated three alternatives:

The Service adopted Alternative C, the “Preferred Alternative,” as the comprehensive conservation plan for guiding the direction of the refuge for the next 15 years. The overriding concern reflected in this CCP is that wildlife conservation assumes first priority in refuge management; wildlife-dependent recreational uses are allowed if they are compatible with wildlife conservation. Wildlife-dependent recreation uses (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) will be emphasized and encouraged.

#### *Alternative A. No Action Alternative*

Alternative A represents no change from current management of the refuge. Under this alternative, the refuge would continue to be managed as it is at present. Management of listed species, migratory birds, black bears, non-native species, other wildlife, refuge habitats, water quality, and cultural resources would be minimal. Public use opportunities would not be expanded. The one staffed position would be abolished, and the refuge would not be staffed other than with a shared law enforcement officer. Work would continue to be provided by Piedmont NWR staff and volunteers. Opportunities for land acquisitions would continue to be pursued.

#### *Alternative B. Custodial management*

The focus of Alternative B is custodial management in which refuge staff would cease all active management of both upland and wetland habitat at the refuge, employing “passive management” instead. Management of listed species, migratory birds, black bears, non-native species, other wildlife, refuge habitats, water quality, and cultural resources would be the same as under Alternative A. There would be reduced hours for the shared law enforcement officer. There would be no additional land acquisition. Public access would be via foot travel only. No facilities or equipment would be maintained.

#### *Alternative C. Enhanced biological and visitor services programs (Preferred alternative)*

The preferred alternative, Alternative C, is considered to be the most effective management action for meeting the purposes of the refuge by emphasizing enhanced biological programs and visitor services. Management and monitoring of listed species, migratory birds, black bears, non-native species, other wildlife, refuge habitats, water quality, and cultural resources would increase. Management plans for feral hogs, invasive plants, fire, cultural resources, and visitor services would be developed and implemented. Staffing would be increased by adding a law enforcement officer, a

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forestry technician, and an engineering equipment operator, and reinstating a refuge operations specialist and park ranger. Partnerships and funding would be pursued to increase acquisition within the boundary. Public use opportunities would be expanded, including installation of turn lanes, boat access to Stone Creek, boat ramp on the Ocmulgee River, west side to vehicle access and hunting, increase in fishing opportunities, and a canoe trail and boardwalk along Stone Creek. An office and maintenance yard would be constructed at the refuge.

### **Selection Rationale**

Alternative C is selected for implementation because it directs the development of programs to best achieve the refuge purpose and goals; emphasizes enhanced biological programs and visitor services; collects habitat and wildlife data; and ensures long-term achievement of refuge and Service objectives. At the same time, these management actions provide balanced levels of compatible public use opportunities consistent with existing laws, Service policies, and sound biological principles. It provides the best mix of program elements to achieve desired long-term conditions.

Under this alternative, all lands under the management and direction of the refuge will be protected, maintained, and enhanced to best achieve national, ecosystem, and refuge-specific goals and objectives within anticipated funding and staffing levels. In addition, the action positively addresses significant issues and concerns expressed by the public.

### **Environmental Effects**

Implementation of the Service's management action is expected to result in environmental, social, and economic effects as outlined in the CCP. Habitat management, population management, land conservation, and visitor services management activities on Bond Swamp NWR would result in potential impacts to water quality, wildlife disturbance, vegetation disturbance, user group conflicts, effects on adjacent landowners, and land ownership and site development. These effects are detailed as follows:

Under this alternative the quantity and quality of the refuge's habitats, including open water, wetlands, upland forests, bottomland hardwoods, clearings and swamp, would either remain the same or improve slightly. Desired future conditions for habitats of Bond Swamp would be defined and a forest management plan would be developed including appropriate forest inventory and silvicultural treatments for improving forest habitats for migratory birds, threatened/endangered species, and other trust resources. Silvicultural treatments, such as thinning, planting, selective harvesting, or developing small forest clearings, would be planned to provide benefits to forest-dependent wildlife. Habitat quality for migratory birds (including both waterfowl and neotropical migratory forest-dependent birds) and other species would improve. Additionally, the refuge would collaborate with the Georgia Power Company to maintain open habitats within rights-of-way to benefit butterflies and certain bird species (e.g., indigo buntings and blue grosbeaks). This alternative would also inventory and identify potential sites for establishment of greentree reservoirs to benefit wintering waterfowl. In doing so, it would benefit the refuge's backwaters, sloughs, and wetlands and maintain or increase the acreage of open water and accessible water habitat for waterfowl, wading birds, and shorebirds.

The proposed development of a Fire Management Plan would allow for prescribed fire for habitat improvement. Use of prescribed fire and thinning could somewhat improve the quality of forest habitats on the refuge. Prescribed fire could reduce the density of the forest understory and mid-story, achieving a more natural forest composition and structure; more open forests would promote the growth of grasses and forbs beneficial to native wildlife.

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The continuing spread and infestation of invasive plant species could degrade the quality of aquatic, wetland, and upland habitats somewhat. However, under Alternative C, an Integrated Pest Management Plan would be developed, which would identify and inventory, prioritize, and suggest appropriate control methods to reduce encroachment by invasive species.

Cultural resources would continue to be protected under Alternative C, as in Alternatives A and B, from human activities (especially excavation) according to the stipulations of the National Historic Preservation Act. Development of a Cultural Resources Management Plan under this alternative would lead eventually to improved management, knowledge, and preservation of the refuge's cultural resources.

Under this alternative, the refuge would cooperate closely with state and local government agencies and non-governmental organizations to characterize the status of refuge waters and fish species with regard to presence and levels of toxins by conducting contaminant surveys on the refuge. These surveys would update information on the status of key toxic contaminants, such as mercury, other heavy metals, fecal coliform, and pesticides. These surveys could trigger actions that could preclude large-scale water quality degradation and ensure timely fish consumption advisories. Likewise, improved communication with the Service's Ecological Services Office in Athens, Georgia, on Section 404 permit applications would provide more effective input to safeguard the refuge's interests, and contribute toward ensuring that policies and upstream management promote hydrologic regimes supportive of wetland and bottomland system integrity. Alteration of river and stream hydrology of refuge watersheds that cause detrimental and cascading impacts to ecosystem and community function across all levels may be reduced.

Overall, visitor services and public use opportunities would increase under Alternative C. Preparation and implementation of a Visitor Services Plan would help organize and systematize the refuge's visitor services, with a probable increase in the quantity and quality of visitor experiences. The quality of the visitor experience would also benefit from improved visitor welcome and orientation facilities proposed under this alternative, such as directional signage, kiosks, and parking lots. Visitation would likely increase with proposed improved visitor access on the east and west sides of the refuge. For the east side, the refuge would work with the Georgia Department of Transportation and the Federal Highway Administration (Federal Lands Highway Division) to install turning lanes at entrances, improve Stone Creek Road, and provide boat and canoe/kayak access to Stone Creek. On the west side, vehicular access would be opened by locating rights-of-way. The refuge would also work with the Georgia Department of Natural Resources to locate a boat ramp along the Ocmulgee River.

Hunting opportunities would be substantially increased as this alternative would maintain or expand existing hunts and add small game, wild turkey, and waterfowl hunts. Additionally, the west side of the refuge would be open to hunting once access is provided. Public fishing opportunities would increase with more general access on the east and west sides, and particularly boat access to Stone Creek and a boat ramp on the Ocmulgee River.

Wildlife observation and photography facilities and opportunities would be expanded and enhanced through the development of a canoe trail on Stone Creek, improvement of the viewshed at the Brown's Mount overlook, and development of a boardwalk along Stone Creek. Environmental education and interpretation programs would also be expanded and enhanced through cooperation with partners to develop and implement an educational program that provides an understanding and appreciation of the refuge's ecology and historic and present human influence on the region's ecosystems. The addition of a park ranger dedicated to environmental education and interpretation would provide support and continuity for development and implementation of such programs.

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Expanded community outreach would likely increase the visibility and role of Bond Swamp NWR in the wider community. The refuge's social and economic contributions to Bibb and Twiggs Counties would be expanded modestly as visitation by local and state residents would likely increase.

## **Potential Adverse Effects and Mitigation Measures**

### *Wildlife Disturbance*

Disturbance to wildlife at some level is an unavoidable consequence of any public use program, regardless of the activity involved. Obviously, some activities innately have the potential to be more disturbing than others. The management actions to be implemented have been carefully planned to avoid unacceptable levels of impact.

As currently proposed, the known and anticipated levels of disturbance of the management action are considered minimal and well within the tolerance level of known wildlife species and populations present in the area. Implementation of the public use program would take place through carefully controlled time and space zoning, establishment of protection zones around key sites, closures of all-terrain vehicle trails, and routing of roads and trails to avoid direct contact with sensitive areas, such as nesting bird habitat. All hunting activities (season lengths, bag limits, number of hunters) would be conducted within the constraints of sound biological principles and refuge-specific regulations established to restrict illegal or non-conforming activities. Monitoring activities through wildlife inventories and assessments of public use levels and activities would be utilized, and public use programs would be adjusted as needed to limit disturbance.

### *User Group Conflicts*

As public use levels expand across time, some conflicts between user groups may occur. Programs would be adjusted, as needed, to eliminate or minimize these problems and provide quality wildlife-dependent recreational opportunities. Experience has proven that time and space zonings, such as establishment of separate use areas, use periods, and restricting numbers of users, are effective tools in eliminating conflicts between user groups.

### *Effects on Adjacent Landowners*

Implementation of the management action would not impact adjacent or in-holding landowners. Essential access to private property would be allowed through issuance of special use permits. Future land acquisition would occur on a willing-seller basis only, at fair market values within the approved acquisition boundary. Lands are acquired through a combination of fee title purchases and/or donations and less-than-fee title interests (e.g., conservation easements, cooperative agreements) from willing sellers. Funds for the acquisition of lands within the approved acquisition boundary would likely come from the Land and Water Conservation Fund or the Migratory Bird Conservation Act. The management action contains neither provisions nor proposals to pursue off-refuge stream bank riparian zone protection measures (e.g., fencing) other than on a volunteer/partnership basis.

## **Land Ownership and Site Development**

Proposed acquisition efforts by the Service would result in changes in land and recreational use patterns, since all uses on national wildlife refuges must meet compatibility standards. Land ownership by the Service also precludes any future economic development by the private sector. Potential development of access roads, dikes, control structures, and visitor parking areas could lead to minor short-term negative impacts on plants, soil, and some wildlife species. When site development activities are proposed, each activity will be given the appropriate National Environmental Policy Act consideration during pre-construction planning. At that time, any required

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mitigation activities will be incorporated into the specific project to reduce the level of impacts to the human environment and to protect fish and wildlife and their habitats.

As indicated earlier, one of the direct effects of site development is increased public use; this increased use may lead to littering, noise, and vehicle traffic. While funding and personnel resources will be allocated to minimize these effects, such allocations make these resources unavailable for other programs.

The management action is not expected to have significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988.

### **Coordination**

The management action has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include:

- All affected landowners
- Congressional representatives
- Governor of Georgia
- Georgia Department Natural Resources, Wildlife Resources Division
- Georgia State Historic Preservation Officer
- Local community officials
- Interested citizens
- Conservation organizations

### **Findings**

It is my determination that the management action does not constitute a major federal action significantly affecting the quality of the human environment under the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27), as addressed in the Environmental Assessment for the Bond Swamp National Wildlife Refuge:

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment. (Environmental Assessment, page 105)
2. The actions will not have a significant effect on public health and safety. (Environmental Assessment, page 105)
3. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas. (Environmental Assessment, pages 106 and 112)
4. The effects on the quality of the human environment are not likely to be highly controversial. (Environmental Assessment, pages 107, 113, and 128)
5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment. (Environmental Assessment, page 107)
6. The actions will not establish a precedent for future actions with significant effects nor do they represent a decision in principle about a future consideration. (Environmental Assessment, page 112)

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7. There will be no cumulatively significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions. (Environmental Assessment, pages 122 and 128)
  8. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources. (Environmental Assessment, page 106)
  9. The actions are not likely to adversely affect threatened or endangered species, or their habitats. (Environmental Assessment, page 126)
  10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment. (Environmental Assessment, page 106)

### Supporting References

Fish and Wildlife Service. 2009. Draft Comprehensive Conservation Plan and Environmental Assessment for Bond Swamp National Wildlife Refuge, Bibb and Twiggs Counties Georgia. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region.

### Document Availability

The Environmental Assessment was Section B of the Draft Comprehensive Conservation Plan for Bond Swamp National Wildlife Refuge and was made available in June 2009. Additional copies are available by writing: Bond Swamp National Wildlife Refuge, 718 Round Oak- Juliette Road, Round Oak, Georgia 31038.

  
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Acting Regional Director

9-24-09  
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Date