

A close-up photograph of an Alabama Beach Mouse (Peromyscus polionotus) sitting in its sandy nest. The mouse is light-colored with a dark eye and is surrounded by dry, yellowish-brown grasses and twigs. The nest is built into a hole in the sand. The background is slightly blurred, showing more of the nest's interior and some green vegetation.

U.S. Fish & Wildlife Service

# **Bon Secour National Wildlife Refuge**

## **Comprehensive Conservation Plan**

*Alabama Beach Mouse  
USFWS Photo*

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

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# Bon Secour National Wildlife Refuge

## Comprehensive Conservation Plan



U.S. Fish and Wildlife Service  
Southeast Region

November 2005

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**COMPREHENSIVE CONSERVATION PLAN**

**BON SECOUR NATIONAL WILDLIFE REFUGE**

Baldwin and Mobile Counties, Alabama

**U.S. Department of the Interior  
Fish and Wildlife Service  
Southeast Region  
1875 Century Boulevard  
Atlanta, Georgia 30345**

**November 2005**

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## TABLE OF CONTENTS

### SECTION A. COMPREHENSIVE CONSERVATION PLAN

I. BACKGROUND .....	1
Introduction .....	1
Purpose and Need For The Plan .....	1
Fish and Wildlife Service .....	1
National Wildlife Refuge System .....	2
Legal Policy Context .....	3
Relationship To State Wildlife Agency .....	3
Ecosystem Context .....	3
Ecological Threats and Problems .....	4
Conservation Priorities .....	7
Central Gulf Coast Ecosystem Team 5-Year Action Plan .....	8
North American Bird Conservation Initiative .....	8
North American Waterfowl Management Plan .....	8
Partners-in-Flight Bird Conservation Plan .....	9
U.S. Shorebird Conservation Plan .....	9
North American Waterbird Conservation Plan .....	10
Mobile Bay National Estuary Program, Comprehensive Conservation and Management Plan .....	10
Weeks Bay National Estuarine Research Reserve Management Plan .....	10
Alabama Coastal Area Management Plan .....	10
Fort Morgan Peninsula Resource Assessment .....	11
Alabama Gulf Coast Strategic Plan for Tourism .....	11
II. THE REFUGE .....	13
Introduction .....	13
History and Purposes Of The Refuge .....	13
Refuge Environment .....	15
Biological Environment .....	15
Physical Environment .....	27
Refuge Administration and Management .....	28
Social and Economic Environment .....	37
Cultural Environment .....	39
Significant Resource Threats and Problems .....	41
III. PLAN DEVELOPMENT .....	49
Introduction .....	49
Public Involvement and Planning Process .....	49
Summary Of Issues, Concerns, and Opportunities .....	50
Fish and Wildlife Populations .....	50
Habitats .....	51
Resource Protection .....	51
Environmental Education and Outreach .....	51
Public Use .....	52
IV. MANAGEMENT DIRECTION .....	53
Introduction .....	53

---

Vision .....	53
Goals, Objectives, and Strategies .....	54
Goal 1: Fish and Wildlife Populations .....	54
Goal 2: Habitats .....	58
Goal 3: Resource Conservation .....	61
Goal 4: Public Use and Environmental Education .....	65
 V. PLAN IMPLEMENTATION .....	 73
Introduction .....	73
Proposed Projects and Personnel .....	73
Funding and Personnel .....	78
Volunteers .....	81
Partnership Opportunities .....	81
Step-Down Management Plans .....	81
Monitoring and Adaptive Management .....	81
 VI. LIST OF PREPARERS.....	 83
 <b>SECTION B. APPENDICES</b>	
 APPENDIX I. GLOSSARY .....	 85
 APPENDIX II. REFERENCES AND LITERATURE CITATIONS.....	 97
 APPENDIX III. RELEVANT LEGAL MANDATES .....	 103
 APPENDIX IV. SUMMARY OF PUBLIC COMMENTS .....	 111
Public Scoping Comments .....	111
Draft Comprehensive Conservation Plan And Environmental Assessment Comments .....	114
 APPENDIX V. BUDGET REQUESTS .....	 125
Refuge Operating Needs System (RONS) .....	125
Maintenance Management System Needs .....	126
 APPENDIX VI. REFUGE BIOTA .....	 127
 APPENDIX VII. COMPATIBILITY DETERMINATIONS.....	 147
 APPENDIX VIII. INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION.....	 159
 APPENDIX IX. FINDING OF NO-SIGNIFICANT IMPACT .....	 163

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## List of Figures

Figure 1. Central Gulf Coast Ecosystem, Fish and Wildlife Service .....	5
Figure 2. Planning study area, Bon Secour National Wildlife Refuge, Baldwin and Mobile counties, Alabama .....	14
Figure 3. Alabama beach mouse habitat on Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	17
Figure 4. Sea turtle nesting along the Fort Morgan Peninsula, Baldwin County, Alabama .....	18
Figure 5. Perdue Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	20
Figure 6. Sand Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	21
Figure 7. Little Point Clear Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	23
Figure 8. Fort Morgan Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	24
Figure 9. Little Dauphin Island Unit, Bon Secour National Wildlife Refuge, Mobile County, Alabama (acquisition and ownership) .....	25
Figure 10. Skunk Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama (acquisition and ownership) .....	26
Figure 11. Wetland Resources, Perdue Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	31
Figure 12. Wetland resources, Sand Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	32
Figure 13. Wetland resources, Little Point Clear Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	33
Figure 14. Wetland resources, Fort Morgan Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama .....	34
Figure 15. Administrative and public use facilities of Bon Secour National Wildlife Refuge .....	35
Figure 16. Organization chart, Bon Secour National Wildlife Refuge .....	37
Figure 17. Fort Morgan Peninsula zoning district .....	42
Figure 18. Fort Morgan Peninsula zoning district .....	43
Figure 19. Proposed recreational facilities for the Sand Bayou Unit, Bon Secour National Wildlife Refuge .....	69
Figure 20. Proposed recreational facilities for the Perdue Unit, Bon Secour National Wildlife Refuge .....	70
Figure 21. Proposed recreational facilities for the Little Point Clear Unit, Bon Secour National Wildlife Refuge .....	71
Figure 22. Proposed recreation facilities for the Fort Morgan Unit, Bon Secour National Wildlife Refuge .....	72
Figure 23. Proposed organizational chart for Bon Secour National Wildlife Refuge .....	80

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**List of Tables**

Table 1. Acquisition history for the Bon Secour National Wildlife Refuge, Baldwin and Mobile counties, Alabama. ....	28
Table 2. Land acquisition figures and acquisition strategies employed for the Bon Secour National Wildlife Refuge through October 2003. ....	29
Table 3. Prioritized acquisition acreage (habitat) and estimated values for the Bon Secour National Wildlife Refuge.....	30
Table 4. Funding for Bon Secour National Wildlife Refuge, Fiscal Years 1999-2003.....	36
Table 5. Summary of ecological threats and problems facing Bon Secour National Wildlife Refuge. ....	44
Table 6. Summary of concerns reflected on the Bon Secour National Wildlife Refuge Planning Packet. ....	50
Table 7. Proposed projects and personnel costs for Bon Secour National Wildlife Refuge. ....	79
Table 8. New personnel needed to fulfill the purposes of the refuge and to implement the Final Comprehensive Conservation Plan. ....	79
Table 9. Proposed step-down management plans for Bon Secour National Wildlife Refuge. ....	82

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## SECTION A: COMPREHENSIVE CONSERVATION PLAN

# I. BACKGROUND

### INTRODUCTION

This Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge was prepared to guide management actions and to provide direction for the refuge. Fish and wildlife conservation will receive first priority in refuge management; wildlife-dependent recreation will be allowed and encouraged as long as it is compatible with, and does not detract from, the mission of the refuge or the purposes for which it was established.

A planning team developed a range of alternatives that best met the goals of the refuge and that could be implemented within the 15-year planning period. This comprehensive conservation plan describes the management alternative selected by the Fish and Wildlife Service and its effects on the environment.

### PURPOSE AND NEED FOR THE PLAN

The plan will serve as an operational guide for managing the refuge, for achieving the refuge's purposes; for attaining the vision and goals developed for the refuge; for contributing to the National Wildlife Refuge System mission; and for addressing key problems, issues, and relevant mandates.

The plan is designed to:

- Provide a clear statement of refuge management direction;
- Provide refuge neighbors, visitors, and government officials with an understanding of Service management actions on and around the refuge;
- Ensure that Service management actions, including land protection and recreation/education programs, are consistent with the mandates of the National Wildlife Refuge System; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

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

### FISH AND WILDLIFE SERVICE

As part of its mission, the Service manages more than 540 national wildlife refuges covering over 95 million acres. These areas comprise the National Wildlife Refuge System, the world's largest collection of lands set aside specifically for fish and wildlife. The majority of these lands, 77 million acres, is in Alaska. The remaining acres are spread across the other 49 states and several United States territories. In addition to refuges, the Service manages thousands of small wetlands and other special management areas. It operates 66 national 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

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oversees the Federal Aid program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

## **NATIONAL WILDLIFE REFUGE SYSTEM**

The mission of the National Wildlife Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997 is:

- ...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. •

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

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

Approximately 38 million people visited national wildlife refuges in 2002, most to observe wildlife in their natural habitats. As the number of visitors grows, there are significant economic benefits to local communities. In 2001, 82 million people, 16 years and older, either 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 averaged 120 per refuge, up from an average of 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 federal dollar spent on the Refuge System, surrounding communities benefitted 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.

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The wildlife and habitat vision for national wildlife refuges stresses that wildlife comes first; that ecosystems, biodiversity, and wilderness are vital concepts in refuge management; that refuges must be healthy and growth must be strategic; that the Refuge System serves as a model for habitat management with broad participation from others; and will be facilitated to provide outstanding opportunities to participate in outdoor recreation and to foster an appreciation for refuges and wildlife.

## **LEGAL POLICY CONTEXT**

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

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

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

## **RELATIONSHIP TO STATE WILDLIFE AGENCY**

A provision of the National Wildlife Refuge System Improvement Act of 1997, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with other state fish and game agencies and tribal governments during the course of acquiring and managing refuges. State wildlife management areas and national wildlife refuges provide the foundation for the protection of fish and wildlife species and contribute to their overall health and sustainment. An essential part of comprehensive conservation planning is integrating common mission objectives where appropriate.

The Alabama Department of Conservation and Natural Resources 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 (<http://www.dcnr.state.al.us>). The Department's major goal is to promote stewardship and enjoyment of Alabama's natural resources for both present and future generations. It is responsible for freshwater fish, wildlife, marine resources, waterway safety, state lands, state parks, and other natural resources. The Department manages 24 state parks; 23 fishing lakes; 3 fish hatcheries; 2 waterfowl refuges; 2 wildlife sanctuaries; 34 wildlife management areas; and a mariculture center. It has responsibility for more than 645,000 acres of trust lands set aside for wildlife purposes. 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 Alabama.

## **ECOSYSTEM CONTEXT**

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Sustainable communities and species conservation and recovery require the joint efforts of private landowners and local communities, as well as state and federal governments. Bon Secour National Wildlife Refuge lies in the southeastern part of a larger Fish and Wildlife Service management unit (watershed) referred to as the Central Gulf Coast Ecosystem (Figure 1). The Service is developing cooperative partnerships in an effort to reduce the declining trend of fish and wildlife populations and biological diversity within this ecosystem.

The Central Gulf Coast Ecosystem is characterized by flat to rolling topography broken by numerous streams and river bottoms. The estuaries and coastal waters and lands located at the lower end of the Central Gulf Coast Ecosystem in the Mobile River basin include saline, brackish (mixed saline and fresh), and fresh waters, as well as coastlines and adjacent lands. Coastal beach/dunes, strands, offshore barrier islands, tidal marsh and freshwater wetlands, pine woodlands, and live oak forests are interrelated features, which are crucial as habitats for coastal fish and wildlife. Uplands are dominated by pine, originally longleaf and slash in the south and shortleaf mixed with hardwoods in the north. These are fire-maintained systems that give way to loblolly pines and hardwoods in more damp areas and bottomland hardwood forests in extensive lowland drainages. Today, most forests are fragmented or remain in scattered patches throughout the region.

Flood waters and storms once recharged aquatic and terrestrial habitats and created rich, dynamic systems that supported a diverse abundance of fish and wildlife species. Currently, however, water quality is significantly impacted by agricultural and industrial runoff. Rivers and water bodies throughout this ecosystem are highly turbid and laden with pesticides, supporting a small fraction of the once abundant aquatic resources. Declines in fish, wildlife, and habitats have prompted the Service to designate coastal habitats found in this ecosystem as areas of special concern.

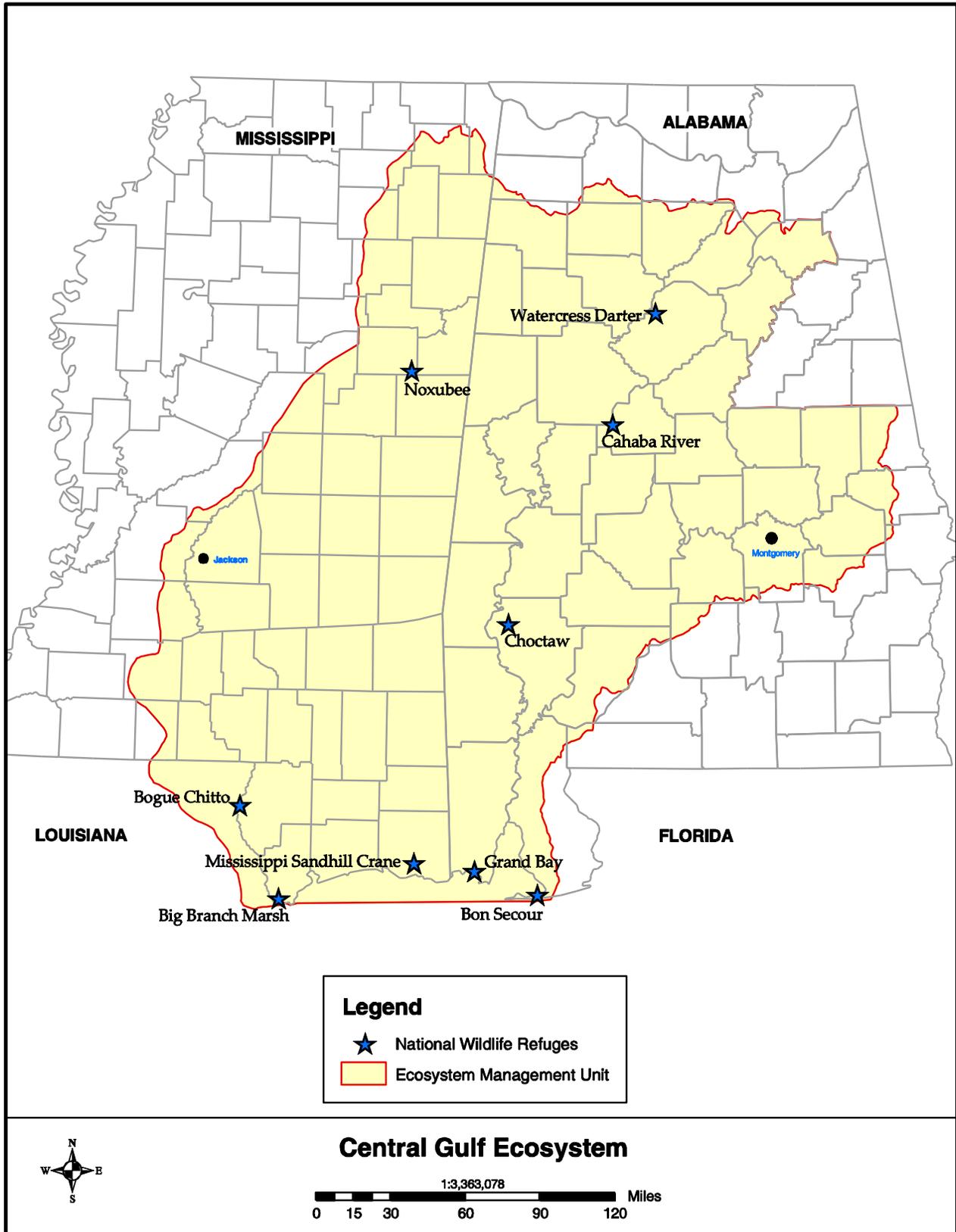
The Service is focusing efforts to adopt collaborative resource partnerships within and outside the agency to reduce the declining trend of fish and wildlife populations and biological diversity, to establish conservation priorities, to clarify goals, and to solve common threats and problems associated with fish and wildlife resources. Biological objectives in the lower Central Gulf, for species groups targeted in this plan, reflect the various local, regional, national, and international conservation plans, including: Loggerhead Sea Turtle Recovery Plan; Alabama Beach Mouse Recovery Plan; U.S. Shorebird Conservation Plan; Partners-in-Flight Initiative; Waterbird Conservation Plan; Mobile Bay Initiative; and North American Waterfowl Management Plan.

## **ECOLOGICAL THREATS AND PROBLEMS**

National wildlife refuges in the Central Gulf serve as part of the last safety net to support biological diversity ■ the greatest challenge facing the Service. Impacts and underlying causes and threats to biological diversity in this area include:

- Loss and reduction of species with specific habitat requirements;
- Loss, alteration, and fragmentation of high-quality coastal habitat due to development;
- Loss of natural shoreline as a result of development, hydrologic modifications, natural erosion, bulkheading, shoreline armoring, and inadequate coastal engineering;
- Lack of monitoring and regulation to protect fish and wildlife resources; and
- Increased demand for beach access and use resulting in increased disturbance to wildlife.

Figure 1. Central Gulf Coast Ecosystem, Fish and Wildlife Service



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Elimination and fragmentation of coastal habitats have decimated wildlife species throughout the Gulf coast, and are recognized by the Service as serious threats to wildlife in Alabama. Species most adversely affected by fragmentation are those that are area sensitive or that require special habitat such as protected, undisturbed beach dunes that offer secure breeding habitat and a particular food source. Fragmentation affects migratory songbirds, sea turtles, beach mice, and many other species, mostly through high rates of nesting failure and predation. More than 370 species of breeding migratory songbirds, shorebirds, waterfowl, and raptors are found in this region. Some of these species, such as the red-cockaded woodpecker and the Bachman's warbler, have declined significantly and need the benefits of large, managed forest blocks to recover and sustain their existence (C. Hunter, pers. comm., Fish and Wildlife Service).

During the past two centuries, increasing human development, including transportation, housing, water supply, electricity, food, and waste disposal, has caused many changes in the nature and quality of Gulf coastal areas. The primary threat to this ecosystem is the loss of biological diversity. Factors leading to biodiversity loss include: loss and fragmentation of habitat, spread of invasive species, overuse of resources, pollution, and change in global climate.

Implications and complications of biodiversity loss are having an unforeseen effect on jobs and the economy. In the Mobile Bay estuary, the loss of mussel and oyster populations has virtually eliminated one of the largest industries in the region and resulted in significant impacts on both regional economy and culture. More than \$200 million in estimated commercial and sport fishing revenue loss is attributed to the destruction of estuaries between 1954 and 1978 (Mobile Bay Natural Estuary Program 1999).

Dams, locks, levees, and other channel modifications have separated and fragmented the aquatic habitats of many species that depend on free-flowing rivers. Agriculture, forest removal, and coastal development have separated and fragmented terrestrial habitats of many species that depend on large undisturbed blocks of land cover for survival. As a result, this area is experiencing biotic extinctions at a rate unparalleled elsewhere in the continental United States; almost 50 percent of biotic extinctions have occurred in the Mobile Bay watershed within the last century (U.S. Fish and Wildlife Service and Natural Heritage Network Central Databases).

As a further consequence of this habitat fragmentation, many of the surviving populations of coastal fish and wildlife only persist in small and isolated populations, such as those found at Bon Secour Refuge. Without natural avenues of migration, however, exchange of individuals and genetic material between populations becomes virtually impossible. Thus remaining populations are rendered even more vulnerable to habitat modification and degradation, as well as the multitude of impacts associated with coastal development, such as outdoor recreational vehicles, jet skis, feral and free-roaming pets, litter, and pollution.

Coastal ecosystems are fragile and support numerous unique habitats. Forested wetlands, marshes, oyster reefs, and seagrass beds are disappearing rapidly. Alabama has lost 25,000 acres of both wetlands and bay bottoms in the Mobile-Tensaw Delta. Historic (pre-Coastal Zone Management Act) port and industrial development is believed to have caused the vast majority of losses in wetlands and bay water bottoms in and around Mobile Bay (C. Ferraro, pers. comm., Alabama Department of Environmental Management). As of 1998, 45 percent of Mobile County and 32 percent of Baldwin County have been cleared and developed for residential and commercial activities (Mullens et al., 1999). Seagrass beds serve as nurseries for many animal species, including fish, shrimp, and crabs. Many established beds have totally disappeared since the 1960s. An estimated 90 percent of commercial fish and shellfish landings in Alabama rely on these grassy wetlands as critical habitat during

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their life cycles. It is unknown how many acres of seagrass beds have been lost. However, possible reasons for the apparent decline include increased turbidity and/or other water quality problems, changes in water-flow regimes from upstream dam construction, invasive species, and natural variability, such as drought (C. Ferraro, pers. comm., Alabama Department of Environmental Management).

The Mobile River Basin aquatic populations have been severely impacted. The reduction of ecological function in the basin from the impounded waters of 28 major dams, coupled with development related impacts, has resulted in widespread changes in flow, substrate, and water quality in river and stream habitats. States in the southeastern United States have the greatest numbers of imperiled and vulnerable freshwater fish species, with 61 species at risk in Alabama.

Channel modifications and pollution have gradually eliminated large populations of native aquatic species, including fish, mussels, snails, insects, and crustaceans. Aquatic species have become isolated, and without avenues for migration are further affected by land surface pollution runoff. Barriers to movement prevent anadromous fish, including striped bass, Gulf sturgeon, and Alabama shad, from reaching spawning grounds and key habitat areas. Almost 40 percent of North America's aquatic turtles inhabit the drainages of the Mobile River Basin. This basin ranks third in the nation in its variety of fishes and is among the top ten river basins in the world in its diversity of freshwater mussels.

## **CONSERVATION PRIORITIES**

Multiple partnerships have been developed among government and private entities to address the environmental problems affecting various regions. There is a large amount of conservation and protection information that defines the role of the refuge at the local, ecosystem, national, and international 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 in the listed plans and initiatives, along with issues, problems and trends, was reviewed and integrated, where appropriate, into this comprehensive conservation plan.

Conservation management on private lands is extremely important to the future conservation of fish and wildlife resources. To achieve conservation priorities on private lands and in conjunction with public lands, the synergy of all federal, state, tribal, and private organizations, working together, will ensure that the Service not only protects the more important areas, but also reduces redundancy and overlap.

Perhaps the greatest needs of the Service involve communication with the public and public agency participation in efforts to carry out the mission of the National Wildlife Refuge System. Many agencies, organizations, institutions, and businesses have developed relationships with the Service to advance the mission of national wildlife refuges. This comprehensive conservation plan supports, among others, the Partners-in-Flight Plan, the North American Waterfowl Management Plan, the Western Hemisphere Shorebird Reserve Network, and the National Wetlands Priority Conservation Plan.

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## *CENTRAL GULF COAST ECOSYSTEM TEAM 5-YEAR ACTION PLAN*

The restoration, recovery, and protection of pine habitats and associated plant and animal communities are the goals of the Service's Central Gulf Coast Ecosystem Team. Historically, the longleaf pine community was the predominant vegetative community of the southeastern coastal plain, with roughly 60 percent coverage in upland areas. In Alabama, longleaf pine communities are concentrated in Mobile, Baldwin, Washington, and Monroe counties. Virtually all of the virgin timber was cut between 1870 and 1920. Between 1955 and 1994, longleaf pine acreage decreased by 73 percent. Most of the remaining longleaf pine and pine savanna habitats are in private ownership. These habitats have become extremely fragmented and degraded by logging and grazing, as well as by intensive site preparation and fire suppression.

The Central Gulf Coast Ecosystem Team developed a 5-year action plan (October 1996) that addresses refuge contributions to the ecosystem. The following management priorities for migratory birds are identified for Bon Secour Refuge, which is a vital staging and fallout area for birds migrating across the Gulf of Mexico:

- Promote management/restoration/protection of important wintering and breeding habitat;
- Manage refuge lands as migratory habitat bases (anchors) and examples of good habitat;
- Actively support high priority acquisition efforts at Bon Secour Refuge; and
- Support research to identify important habitats, sensitive species, and habitat management techniques.

## *NORTH AMERICAN BIRD CONSERVATION INITIATIVE*

The North American Bird Conservation Initiative is a coalition of government, private and academic organizations, and private industry leaders addressing bird conservation. Priority lands include coastal intertidal habitats that provide critical wintering areas (American oystercatcher), important wintering and spring migration areas (e.g., short-billed dowitcher and dunlin), and important fall staging areas (e.g., red knot). Sizable numbers of brown pelicans, black skimmers, black necked stilts, black rails, least terns, and reddish egrets breed on offshore islands, including Little Dauphin Island, which is part of the refuge. Coastal areas provide important wintering, nesting, and foraging habitats for large numbers of shorebirds, waterfowl (e.g., canvasbacks), and other species. Managed impoundments in coastal areas are important to migrating and wintering dabbling ducks, including the American black duck.

## *NORTH AMERICAN WATERFOWL MANAGEMENT PLAN*

The Gulf Coast Joint Venture, a regional partnership composed of individuals, conservation organizations, and state and federal agencies, implements the North American Waterfowl Management Plan and targets the conservation of migratory birds and their habitats along the western Gulf of Mexico from Brownsville, Texas, to Mobile Bay in Alabama. The primary goal of the joint venture is to provide wintering and stop-over habitat for scaup, canvasbacks, and numerous dabbling duck species. Three major waterfowl habitats have been targeted for Mobile Bay, including coastal marsh, submerged aquatic vegetation, and forested wetlands.

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

Bon Secour Refuge is located in the East Gulf Coastal Plain physiographic planning area. Managed as part of the Partners-in-Flight Plan, the East Gulf Coastal Plain physiographic planning 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. The plan is voluntary and non-regulatory, focusing on relatively common species in areas where conservation actions can be most effective, rather than the frequent local emphasis on rare and peripheral populations.

Conservation issues in this planning area include coastal zone development that rapidly destroys bird habitat. The impact of this change on in-transit migratory birds is difficult to quantify, but considered to be extreme. All remaining maritime community habitat is recommended for protection and acreage increase through restoration, where possible. This includes maritime forests, as well as the emergent wetlands, beaches, and dunes that are crucial to many priority breeding, wintering, and in-transit migratory birds.

A cooperative partnership under the guidance of the North American Waterfowl Management Plan and the Partners-in-Flight Plan has identified the following three bird conservation priorities for the East Gulf Coastal Plain:

- Manage and maintain existing habitats identified as being of value to bird populations;
- Restore or consolidate important habitats; and
- Provide a combination of these strategies to increase and sustain breeding bird populations.

## *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. It 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.

Located within the Southeastern Coastal Plains planning region, the refuge is an important location for breeding shorebirds and transient species during both northbound and southbound migrations. Shorebirds in this planning region face potential impacts primarily from chronic, human-caused disturbance to roosting, nesting, and foraging birds; oil spills; transfer of water rights that may directly or indirectly affect the shorebird food base in some systems by reducing freshwater input into important estuarine habitats; recent, but sharp increases in harvesting pressure on horseshoe crab populations leading to decreasing food resources for northbound migrating shorebirds; barrier beach stabilization that may affect foraging and nesting habitat; contaminants (e.g., agricultural runoff, dredged materials, and water treatment areas); and inadequate management capability on public lands, where high quality habitats should be more available. The well-documented loss of wetland habitats in this region during the last 200 years undoubtedly affects shorebirds.

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## *NORTH 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, introduction of predators and invasive species, pollutants, mortality from fisheries and industries, disturbance, and conflicts arising from abundant species. Particularly important habitats of the southeast 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 the Gulf coast population of brown pelicans. A key objective of this plan is the standardization of data collection efforts to better recommend effective conservation measures.

## *MOBILE BAY NATIONAL ESTUARY PROGRAM, COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN*

Mobile Bay was designated a National Estuary in March 1995 to conserve and restore the bay, which was being threatened by pollution, development, and overuse. There are 14 preservation and protection projects in the Mobile Bay area, including 100,000 acres of wetlands. This combination of federal, state, and local projects helps to reduce the rate of wetland loss.

With joint participation of the State of Alabama, the U.S. Environmental Protection Agency, citizens, elected officials, business and industry representatives, resource users, and managers, the Mobile Bay plan describes a variety of actions to improve priority environmental issues affecting the Mobile Bay Estuary. Priority issues identified in this plan include: habitat loss, regulatory enforcement, non-point source pollution, water quality, growth management, municipal treatment facilities, public education, and industrial impacts.

## *WEEKS BAY NATIONAL ESTUARINE RESEARCH RESERVE MANAGEMENT PLAN*

The Weeks Bay National Estuarine Research Reserve contains 6,018 acres located along the eastern shore of Mobile Bay in Baldwin County. The Reserve was established in 1986 to protect an estuarine system abundant with fish and wildlife. In this watershed, demand for waterfront footage generated by residential and commercial development threatens the ecological balance of coastal habitats. From 1980-1990, the coastal population in Baldwin County grew by 25 percent and from 1990-2000, the population grew by 43 percent (Mobile Bay National Estuary Program 1999). Two of the major goals of the Reserve's management plan are stewardship of natural resources and educating the public about estuaries. The plan calls for the development of partnerships between the Reserve and federal, state, and local agencies to help achieve these goals.

## *ALABAMA COASTAL AREA MANAGEMENT PLAN*

Administered by the Alabama Department of Conservation and Natural Resources, the Coastal Section of the Division of State Lands oversees this plan. Its purpose is to promote, improve, and safeguard lands and waters along the Alabama coast. The goals of the plan are to sustain coastal waters and resources for natural, recreational, and economic benefits; to protect the livelihoods of citizens who live and work along the coast by planning for both natural and man-made impacts which threaten the area; and to provide effective leadership in managing and sustaining coastal resources for all Alabamians. A major focus of the plan includes public outreach efforts such as Adopt-A-Beach, Boaters and Anglers Pledge Program, Annual Coastal Cleanup, National Marine Debris Monitoring Program, and Semi-annual Underwater Cleanup.

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## *FORT MORGAN PENINSULA RESOURCE ASSESSMENT*

The Fort Morgan plan was produced by the Alabama Department of Conservation and Natural Resources, Division of State Lands, Coastal Section. The plan's purpose is to serve as a tool to manage development along the Fort Morgan Peninsula. The plan describes in detail the characteristics of both the natural and man-made environment and projects hypothetical development scenarios. In 1970, only 28 percent of beachfront in Baldwin County was developed. By 1996, 61 percent of the beachfront was developed, while a shift from single-family residences to high-density condominiums and hotels had occurred (Douglas et al., 1999). As the amount of beachfront property in the cities of Orange Beach and Gulf Shores has been reduced due to development, pressures have shifted to the Fort Morgan Peninsula. The assessment recommends the development of a strategic plan to manage growth and safeguard lives, property, and the peninsula's environment.

## *ALABAMA GULF COAST STRATEGIC PLAN FOR TOURISM*

Tourism is vital to the economic health of the Gulf Coast. Funds generated from tourism support schools, facilities, and services. In 1999, the Alabama Gulf Coast Convention and Visitor's Bureau commissioned a strategic plan to determine the future of tourism in the area. In the plan, one of the under-utilized types of tourism was *eco* or nature-based tourism. The plan recommends that the Bureau promote nature-based and adventure tourism by sponsoring a plan for its development, including a major museum/visitor center, trails, tours, interpretive exhibits, and audio-visual programs and by developing facilities that do not threaten the resources.



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## II. The Refuge

### INTRODUCTION

Bon Secour National Wildlife Refuge is located on the Gulf Coast, 8 miles west of the city of Gulf Shores, Alabama, in Baldwin and Mobile counties. The planning study area is divided into five separate management units along the Fort Morgan Peninsula and Little Dauphin Island (Figure 2). Although the refuge was established in 1980, to date, only 6,978 acres have been acquired within the 12,570-acre acquisition boundary, including the 575 acres leased from the State of Alabama. The Service has management jurisdiction along the shoreline above mean high tide, except on the Little Dauphin Island Unit, which contains 560 acres of submerged bottoms managed by the Service. The potential wildlife habitat values of beach/dune, maritime forests, and estuarine habitats provided the impetus to purchase the properties for the refuge.

Management efforts since 1980 have emphasized acquiring land, securing staff to operate the refuge, and initiating conservation programs that benefit endangered wildlife species. However, Service acquisition of key properties, such as inholdings and beach/dune habitat, may not be realized within the 15-year planning period due to budget constraints and landowner preferences. The five units within the acquisition boundary have a significant **edge**, which contributes to the predation of birds, sea turtles, and beach mice. Edge effect is the tendency of a transitional zone between communities to contain a greater variety of species and higher population densities of species than surrounding communities.

Current conservation management projects for the refuge include:

- Recruiting and training staff;
- Improving existing facilities;
- Managing habitats to reduce the threats and problems associated with species of concern;
- Acquiring land to complete refuge boundaries;
- Assisting in sea turtle and Alabama beach mouse recovery; and
- Defining research within the beach/dune area and involving partners and volunteers to accomplish this research.

### HISTORY AND PURPOSES OF THE REFUGE

Bon Secour National Wildlife Refuge was established through both legislative and administrative authorities.

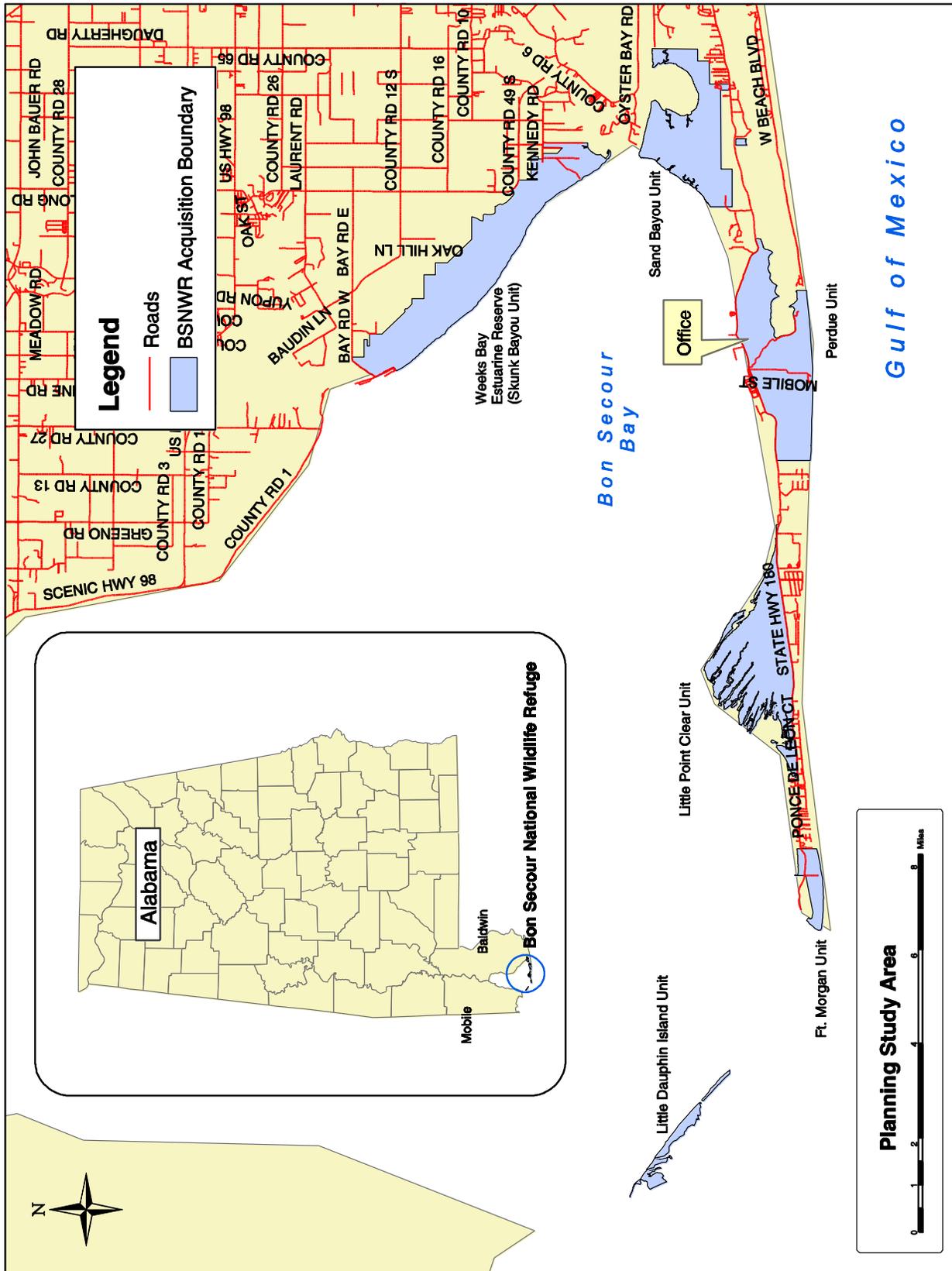
The purposes of the refuge are listed as:

*... to ensure the well-being of these (nationally endangered and threatened species, such as the brown pelican, bald eagle, and several species of sea turtles, as well as many more species identified by the state to be of special concern) and other species, to serve as a living laboratory for scientists and students and to provide wildlife-oriented recreation for the public.*

94 Stat. 483, dated June 9, 1980

(Act to establish the Bon Secour National Wildlife Refuge)

Figure 2. Planning study area, Bon Secour National Wildlife Refuge, Baldwin and Mobile counties, Alabama



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■...to conserve an undisturbed beach/dune ecosystem which includes a diversity of fish and wildlife, and their habitat.●

94 Stat. 484, dated June 9, 1980  
(Act to establish the Bon Secour National Wildlife Refuge)

■...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants...●

16 U.S.C. 1534 (Endangered Species Act of 1973)

■...for the development, advancement, management, conservation, and protection of fish and wildlife resources...▲

16 U.S.C 742f(a)(4) (Fish and Wildlife Act of 1956)

■...for the benefit of the United States Fish and Wildlife Service in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude...●

16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

■...for conservation purposes...●

7 U.S.C. 2002. (Consolidated Farm and Rural Development Act)

## REFUGE ENVIRONMENT

### BIOLOGICAL ENVIRONMENT

#### Fish, Wildlife, and Plant Populations

Bon Secour National Wildlife Refuge was established for the protection of neotropical migratory songbird habitat and threatened and endangered species. These species are given priority when implementing management activities.

*Neotropical migratory songbirds and shorebirds.* Bon Secour Refuge represents the best remaining stopover and staging habitat for neotropical migratory songbirds during the fall and spring migration along the Alabama coastline. Migratory birds utilize this area for resting and building fat reserves critical to successful migration (Moore and Woodrey 1993, and Moore and Woodrey 1997). The refuge also provides crucial habitat for beach nesting birds, such as snowy and Wilson's plovers, American oystercatchers, least terns and black skimmers; secretive marshbirds, such as rails; and migratory and wintering shorebirds on beaches, especially the federally threatened piping plover. A portion of the refuge's Fort Morgan unit and all of Little Dauphine Island are designated as critical habitat for the piping plover. Shorebirds use beaches and washover sites, which support high quality food sources during migration and winter.

*Alabama beach mouse.* This federally listed species inhabits the beach dune and scrub/shrub habitats found along the Fort Morgan Peninsula. Beach mice have experienced a two-thirds reduction in available habitat, primarily due to coastal development. Bon Secour National Wildlife Refuge protects the last remaining undisturbed beach mouse habitat found in Alabama, consisting of several key plant communities that form a mosaic of micro-habitats. Management focus is on protecting sufficient space to support populations, including movement corridors, which serve as conduits for genetic exchange. Beach mouse recovery depends on efforts from federal, state, and private partners to ensure that refuge populations do not become genetically isolated.

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Alabama beach mice are intensively managed at Bon Secour Refuge. Critical habitat for beach mice is currently listed as 500 feet landward to the mean high tide line, which includes the beach dunes; however, the mice also occur in scrub/shrub habitats north of these dunes. New research findings have therefore led the Service to revisit critical habitat for the mouse to include these interior habitats. Figure 3 depicts the distribution of mouse habitat on the Fort Morgan Peninsula based on the most recent information available to the Service. It clearly shows the high degree of habitat fragmentation by coastal development outside of refuge boundaries and the importance of the refuge in securing the continued survival of the species. The Perdue Unit of the refuge represents the largest and best remaining example of beach mouse habitat protecting approximately 4 miles of beach with well-developed dune and scrub/shrub/swale habitat. The Fort Morgan Unit, while differing in topography, also supports substantial numbers of beach mice.

*Sea turtles.* Loggerhead, green, and Kemp's ridley sea turtles have been documented to nest on the refuge. Refuge beaches support nest densities as high or higher (4.5-5.0 nests/mile) than many areas along the Gulf Coast (Figure 4). While the overall numbers of nests for loggerheads are not great relative to Atlantic coast nesting beaches, it is believed that the northern Gulf nesting population may significantly contribute to the male segment of the overall sea turtle population (Thane Wibbles, pers. comm., University of Alabama, Birmingham). This increases the importance of protecting the nesting beaches of the refuge.

Green and loggerhead sea turtles have long been a focus of management concern. Conservation strategies to protect these turtles under the Endangered Species Act include on-site nest monitoring and protection, as well as fostering a public ethic through educational programs. Negotiating with local governments and communities to eliminate or control artificial beachfront lighting, which is known to deter females from nesting and to disorient hatchlings, is also a strategy used to protect these turtles. In 2000, emergent success rate of hatchlings along the Alabama coast was less than 25 percent, as hatchlings were prone to disorientation by artificial light sources. Poor hatching success on the refuge has also been attributed to predation (e.g., ghost crabs, foxes, and coyotes), inundation, and moist sand from low beach elevation. Disorientation due to lights from surrounding developments has been documented on the Perdue and Fort Morgan units. Refuge personnel patrol the beach for sea turtle nests on areas between these units, some of which include private lands.

In 2001, the Service initiated a sea turtle volunteer program called Share the Beach, in an effort to involve local residents, tourists, and businesses in sea turtle conservation. The program was under the management of the Fish and Wildlife Service's Daphne Ecological Services Field Office until 2003, when responsibility shifted to the refuge, primarily for logistical concerns.

Hatching success has increased to 85 percent along the Alabama coast as a result of increased monitoring efforts and public support of conservation measures. The refuge will continue to administer this program until 2005, when Share the Beach will incorporate as a non-profit organization funded by individuals, corporations, grants, and the ■Adopt-A-Nest■ program of the Friends of Bon Secour National Wildlife Refuge. The State of Alabama will become the lead agency and will permit the program. However, due to the refuge's location and proximity to nesting areas, it is expected that refuge staff will continue to manage sea turtle nests on refuge property, and most strandings on and off refuge property.

Figure 3. Alabama beach mouse habitat on Bon Secour National Wildlife Refuge, Baldwin County, Alabama

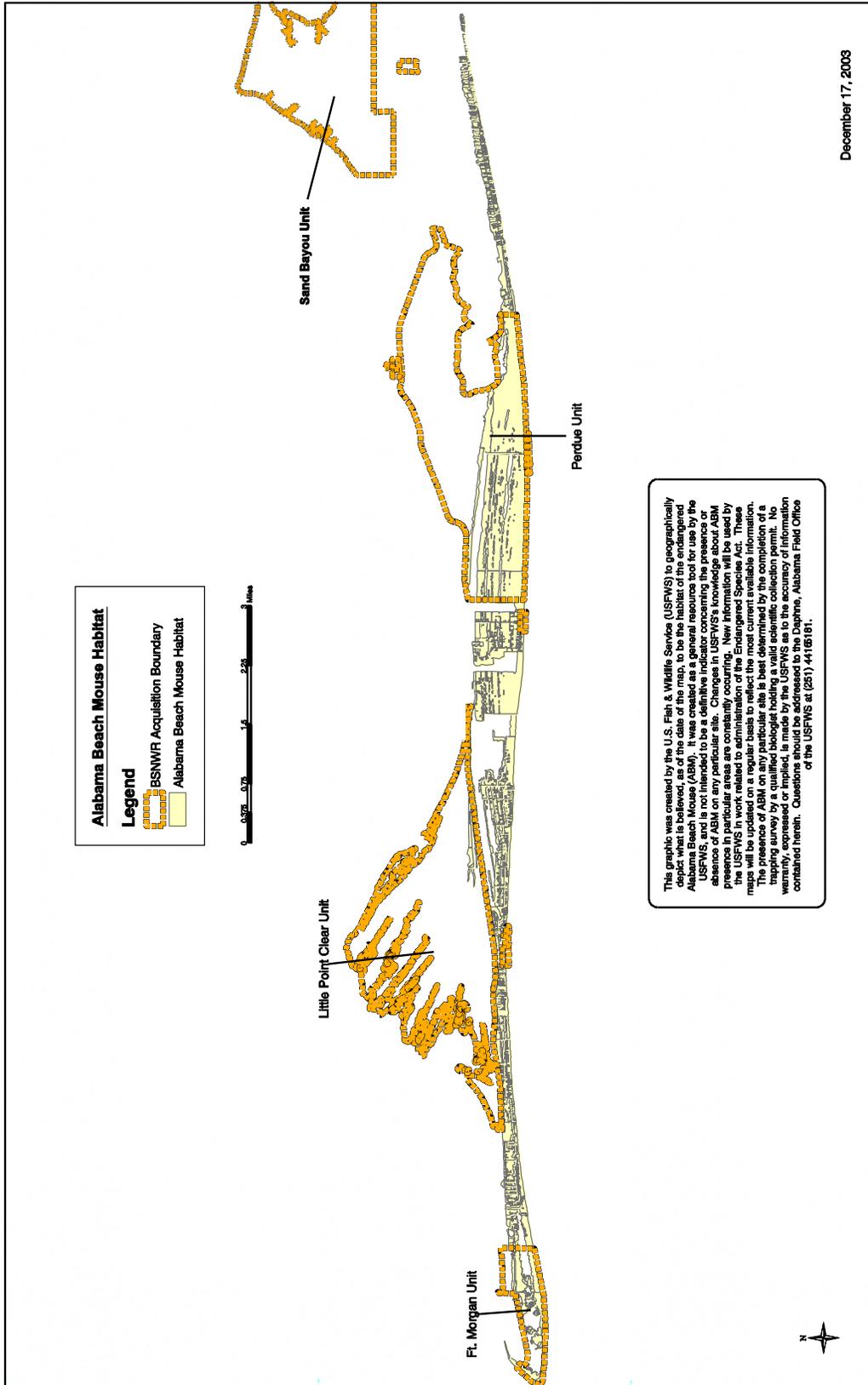
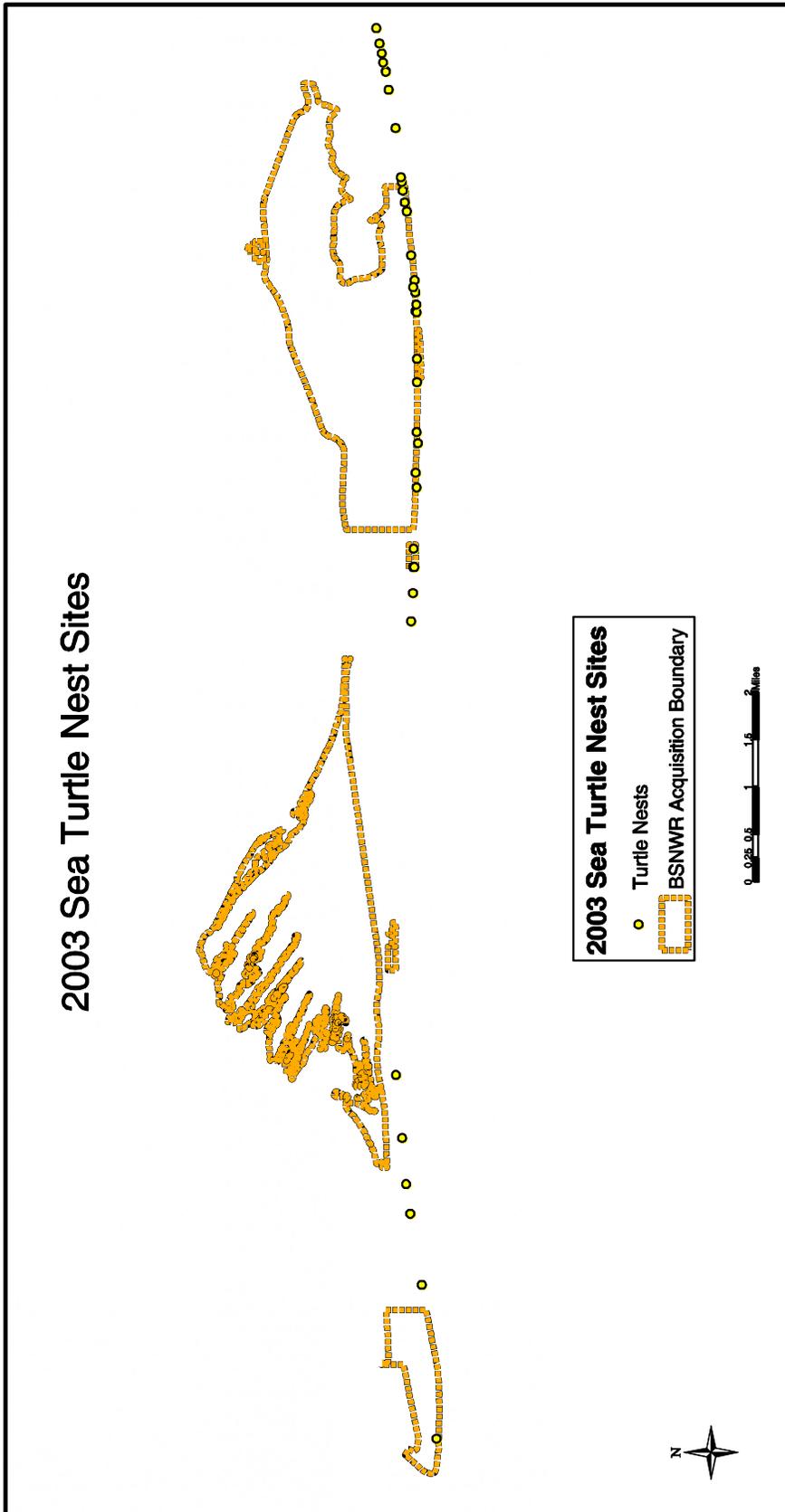


Figure 4. Sea turtle nesting along the Fort Morgan Peninsula, Baldwin County, Alabama



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*Piping plover.* Piping plovers winter along the southern Atlantic Coast and the entire Gulf Coast. Those wintering on the refuge are likely to be a mixture of the threatened Atlantic Coast and the endangered Great Lakes populations. The Fish and Wildlife Service has designated 166 acres of the Fort Morgan Unit and the entire Little Dauphin Island Unit (about 290 acres) as critical habitat. This designation includes the Fort Morgan and Little Dauphin Island units of the refuge. These properties are frequented by refuge visitors who may disrupt foraging or resting plovers and other wintering bird species. The amount of visitor use, however, is unknown. Monitoring disturbance to plovers and their wintering habitat use on the refuge is a critical need.

*Other species.* Other threatened and endangered species found on the refuge include the bald eagle and the wood stork. Species of conservation concern that exist on the refuge include the gopher tortoise, Gulf salt marsh snake, Mississippi diamondback terrapin, black pine snake, eastern coachwhip snake, northern yellow bat, mimic glass lizard, eastern diamondback rattlesnake, and the Gulf Coast tiger beetle.

The refuge includes large and diverse populations of lizards, snakes, toads, and frogs. Bountiful fisheries and oyster grounds are adjacent to the refuge. Bobcats, opossums, eastern cottontails, raccoons, red foxes, coyotes, and armadillos are commonly found in the woodlands. Black bears and red-cockaded woodpeckers historically occurred on the refuge, but have been extirpated.

Ongoing research includes studies on neotropical migratory songbirds on the Fort Morgan Unit, Alabama beach mice on the Perdue Unit, post-hurricane dune restoration on both the Perdue and Fort Morgan units, and sea turtle monitoring and insect surveys in various locations.

### **Habitats**

This exceptional area supports several critically imperiled and federally listed species including the Alabama beach mouse, piping plovers, sea turtles, and a host of other state-listed rarities.

The following is a brief description of each refuge unit with accompanying maps depicting the respective acquisition boundaries and current status of land ownership and management within and adjacent to these boundaries.

*Perdue Unit.* (2,628 acres acquired out of 2,835 acres in the acquisition boundary, Figure 5)  
The Perdue Unit is the largest unit on the refuge. It is bordered on the east and west by high density residential development (Laguna Key Subdivision and Martinique on the Gulf, respectively), to the south by the Gulf of Mexico, and to the north by State Highway 180. A portion of the predominately landlocked, saltwater Little Lagoon also forms a large portion of the eastern refuge boundary.

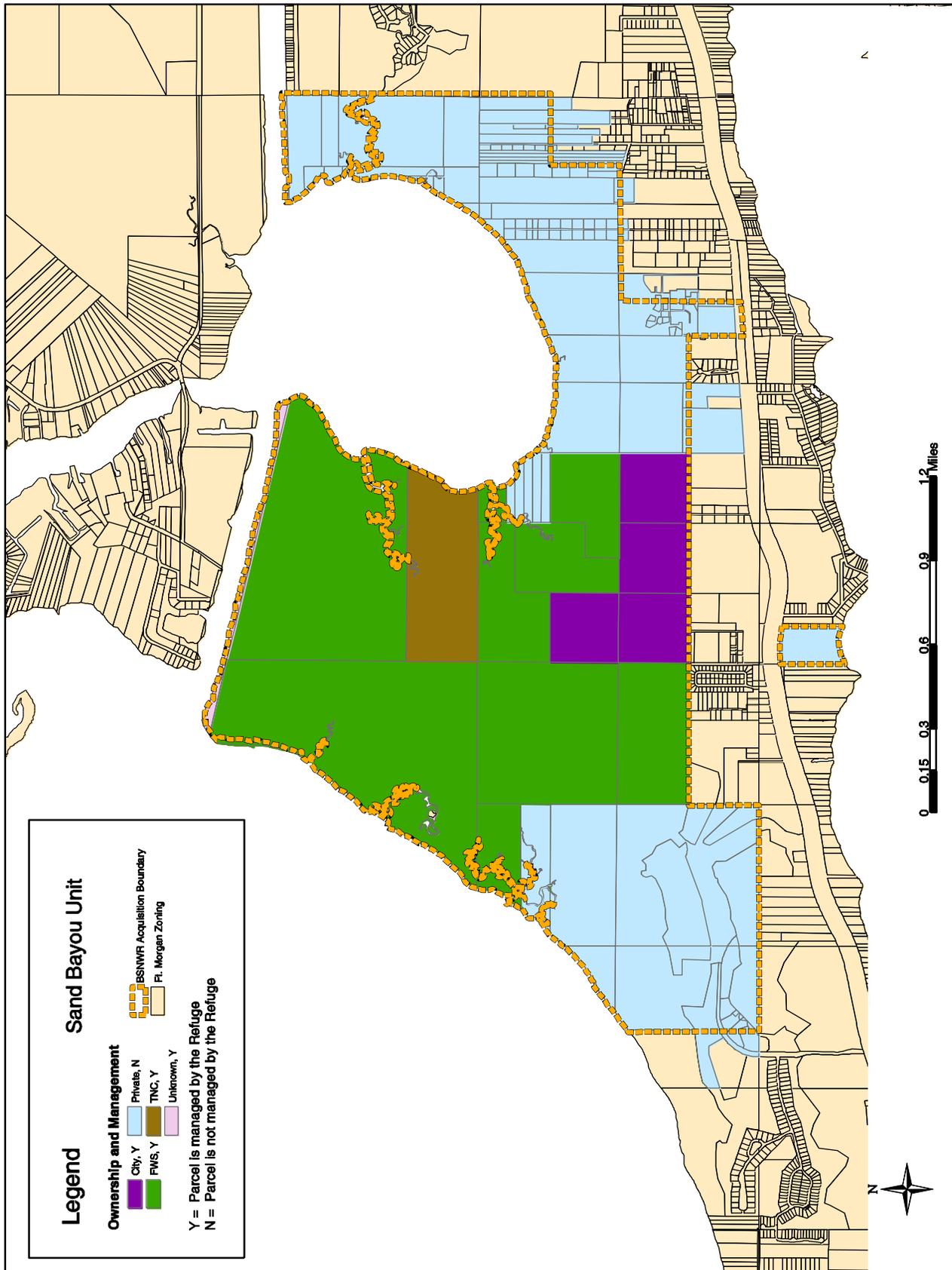
Habitats range from a well-developed beach/dune ecosystem to maritime forests and pine woodlands. There is an extensive scrub/shrub/swale habitat characterized by alternating low, relict dune ridges and wet swale habitats. There are many extensive permanent and semi-permanent wetlands with emergent vegetation found throughout the unit. Also found within the Perdue Unit is the freshwater/brackish water Gator Lake (40 acres).

*Sand Bayou Unit.* (998 acres acquired and 289 acres in acquisitions or leases pending out of 2,208 acres in the acquisition boundary, Figure 6)

Figure 5. Perdue Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama



Figure 6. Sand Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama



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This unit is bordered on the north by the Gulf intracoastal canal and on the east and west by Oyster Bay and Bon Secour Bay. Southern portions of the unit are bordered by predominately low-density residential development and undeveloped properties; however, in recent years, the trend has been towards higher density residential development. A major portion of the land within the acquisition boundary is privately owned with high potential for further development and habitat fragmentation. Habitats include wet pine flatwoods, mixed pine hardwoods, and freshwater marshes composed of black needlerush and smooth cord grass.

*Little Point Clear Unit.* (1,990 acres acquired or managed out of 2,529 acres in the acquisition boundary, Figure 7)

The Little Point Clear Unit is bordered on the east, west, and north by Mobile Bay. The southern boundary is undeveloped private lands, Highway 180, and low-density residential development. Habitats within this unit consist of scrub/shrub, pine flatwoods, saltwater marsh, and tidal creeks. There are many permanent and semi-permanent wetlands scattered across the unit, which is characteristic of dune and swale topography.

*Fort Morgan Unit.* (510 acres acquired or managed, unit complete, Figure 8)

The Fort Morgan Unit is found at the western terminus of the Fort Morgan Peninsula. It is bordered on the south by the Gulf of Mexico, on the north by Mobile Bay, on the west by Mobile Pass, and on the east by low to medium density single-family and multi-family residences. Habitats in this unit consist of beach dunes, brackish water marshes, scrub/shrub, and pine woodlands. The land within this unit is owned by the State of Alabama, and managed by the Alabama State Historical Commission. The natural areas are managed by the Fish and Wildlife Service under a cooperative agreement with the state.

*Little Dauphin Island Unit.* (850 acres, unit complete, Figure 9)

Little Dauphin Island is located just north of the eastern end of Dauphin Island. Access to this island is by water craft only and there is no development. Due to the topography of this sand spit, the habitat is mainly saltwater marsh with low dunes and a small amount of pine savanna. The northwestern tip consists of open mudflats. Of the 850 acres managed, 290 acres are upland and 560 acres are submerged bottoms. The Fish and Wildlife Service has deeded jurisdiction over these bottoms from the State of Alabama.

*Skunk Bayou Unit.* (no acreage within the 3,831-acre acquisition boundary has been acquired, Figure 10)

This unit falls within the planning boundary of the Weeks Bay National Estuarine Research Reserve. Initially, one tract was acquired for this unit, but it was later transferred to the Weeks Bay Reserve when it was established in 1986. From the date legislation was signed to establish the refuge through the present, lands within this unit remain a low priority for meeting the purposes of Bon Secour Refuge.

## **Management**

The Service manages refuge resources and, where possible, coordinates with neighboring land managers, agencies, and landowners to conserve biological diversity.

Figure 7. Little Point Clear Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama

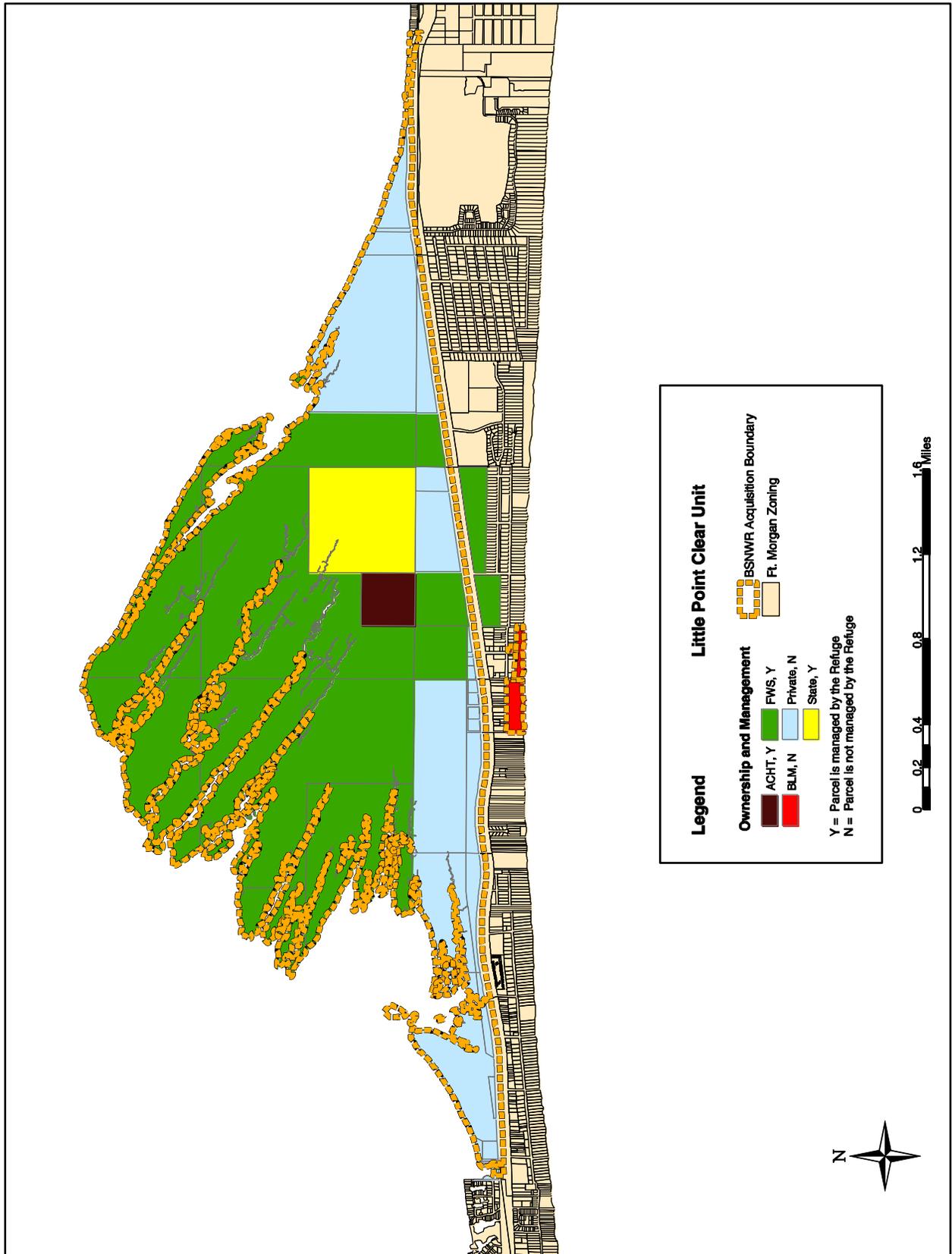


Figure 8. Fort Morgan Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama

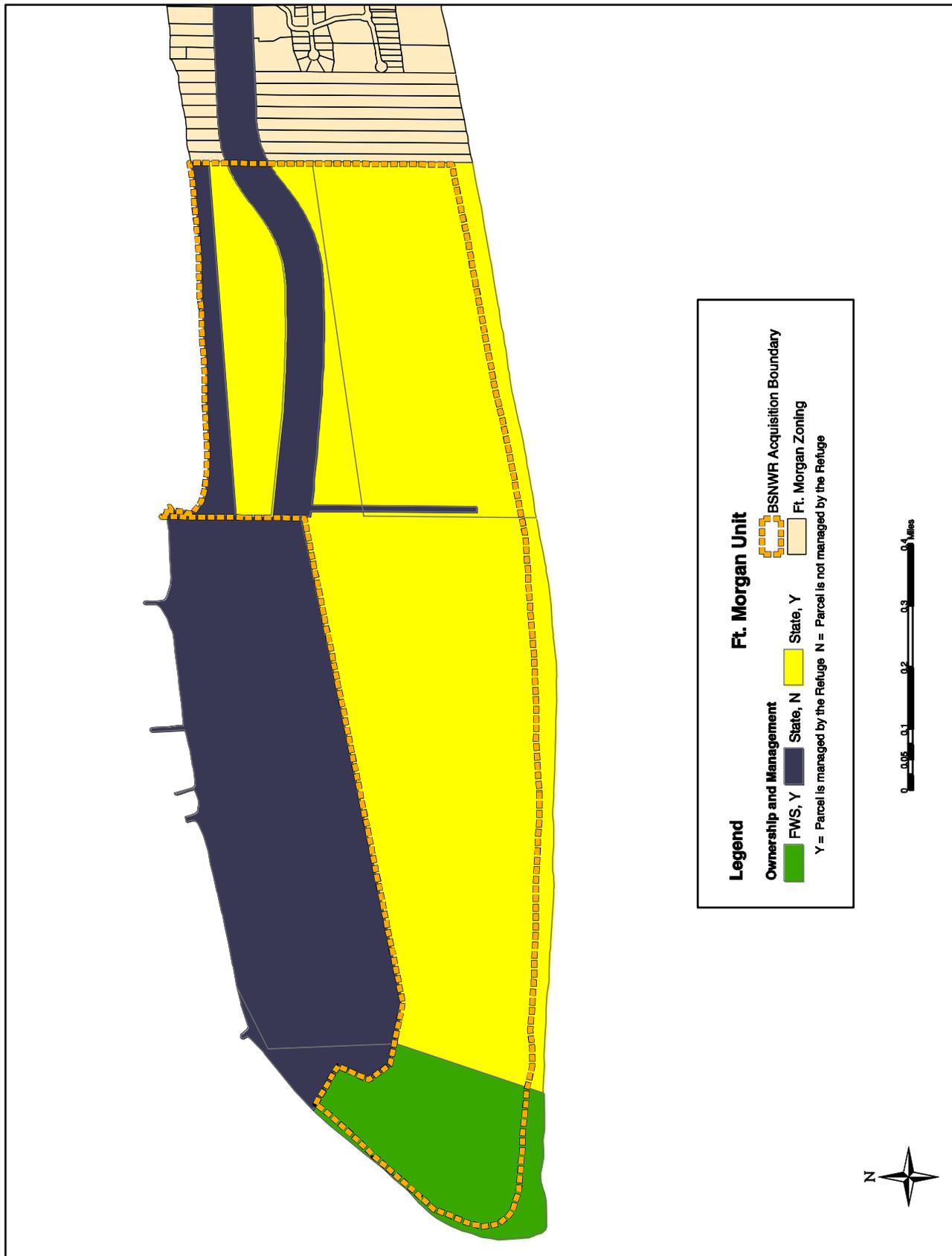
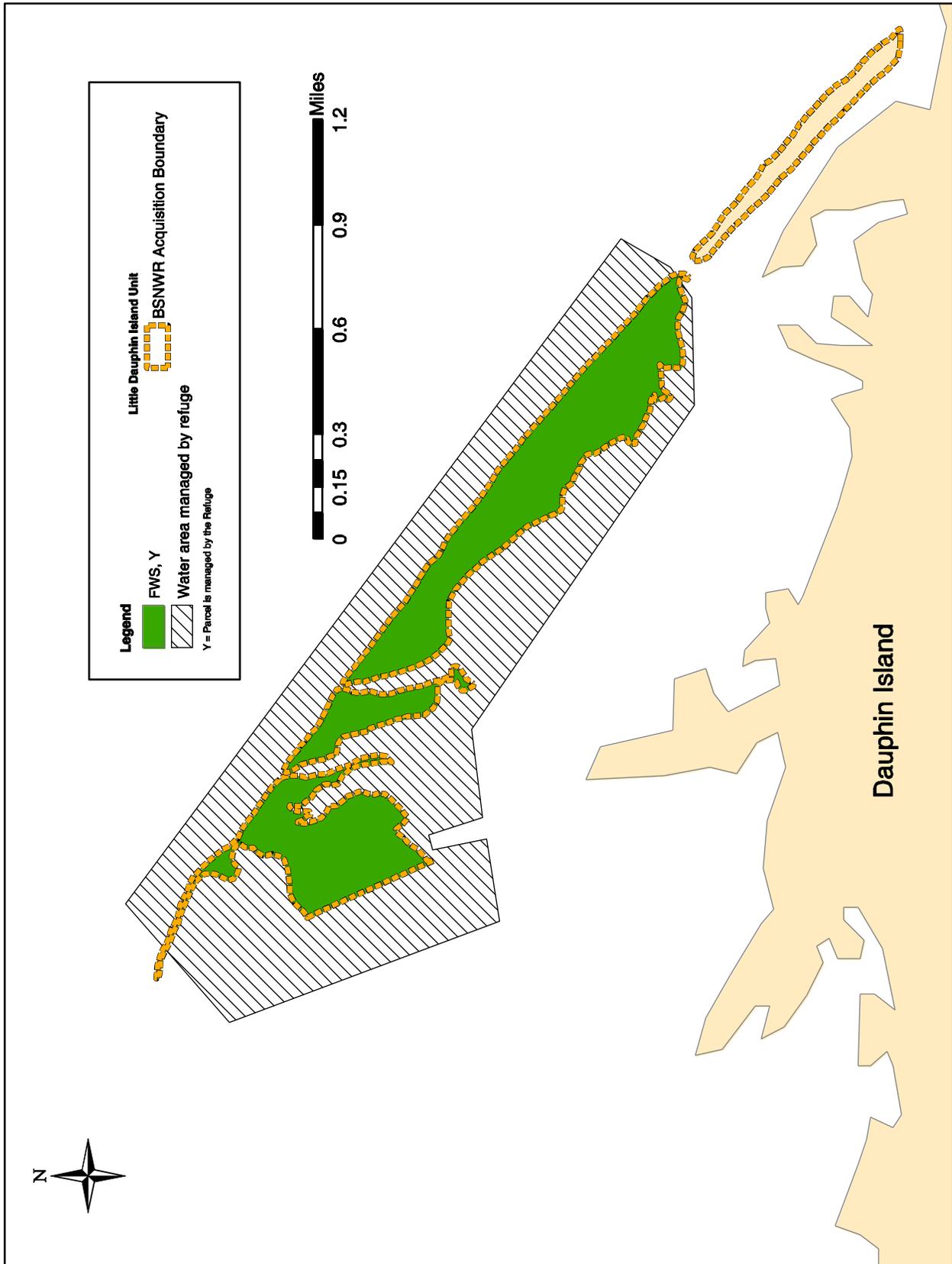
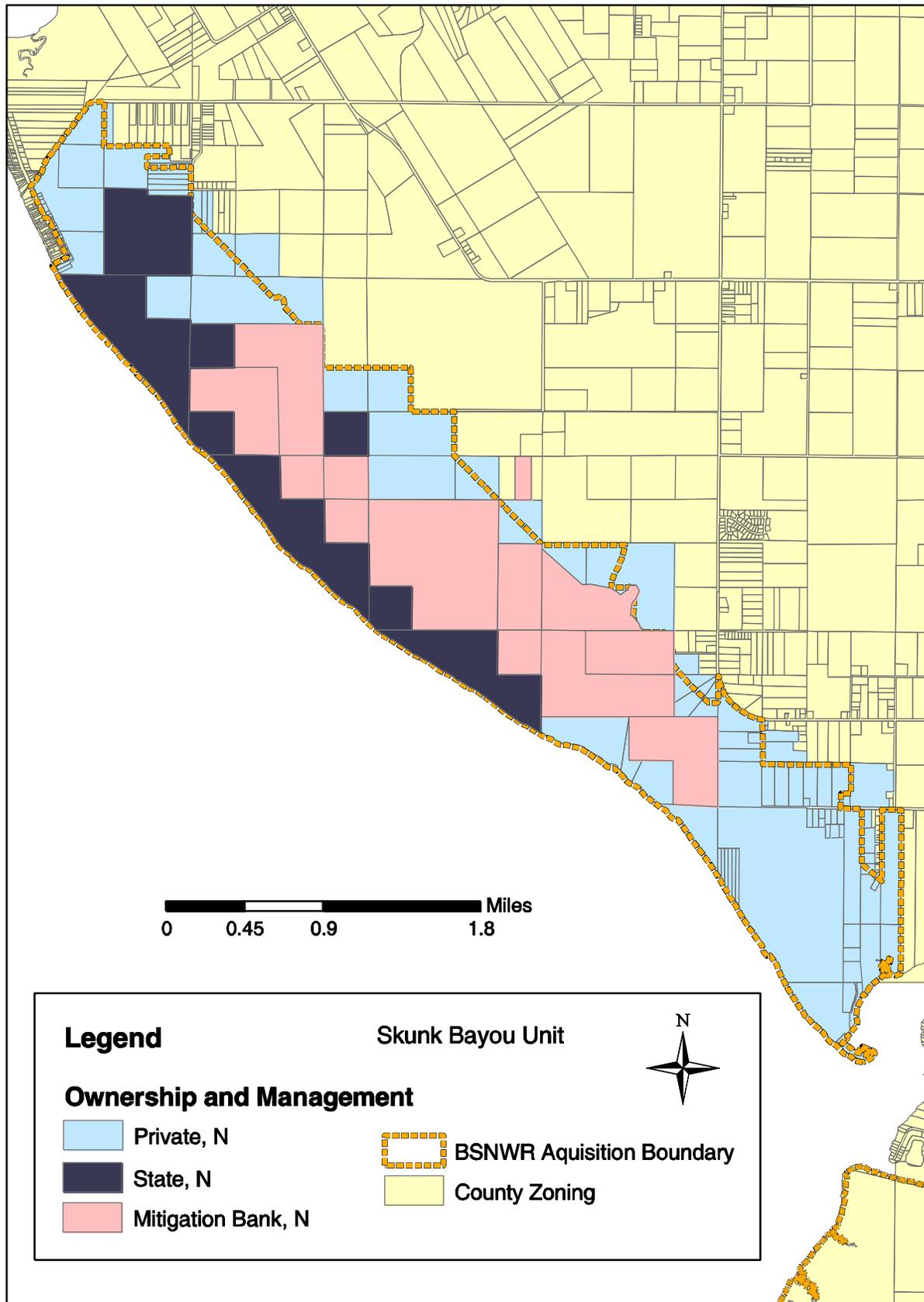


Figure 9. Little Dauphin Island Unit, Bon Secour National Wildlife Refuge, Mobile County, Alabama (acquisition and ownership)



**Figure 10. Skunk Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama (acquisition and ownership)**



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Public land management is playing a key role in developing quality bird habitat at Bon Secour Refuge. Bird habitat priority areas are identified on the refuge and, when restored, will serve as important anchors for biological diversity. Priorities identified for the refuge include a stronger management emphasis on migratory songbirds. Focal species are managed according to refuge size and location, which also contribute to the overall health of the ecosystem.

Mapping and typing of plant communities have not been accomplished for the refuge. The refuge may lie at or near the western range for some plant communities, such as those containing sand pine and scrub oaks. The Little Point Clear Unit contains dunes/swales that are not observed west of the Fort Morgan Peninsula. In addition to community typing, the fire history of the Fort Morgan Peninsula is also unknown.

The only two freshwater ponds on the refuge are Little Gator Lake and Gator Lake. Gator Lake is connected to the Little Lagoon via a small channel. During high tides, the salt water from the Little Lagoon flows into Gator Lake, where a variety of freshwater and saltwater species occur.

Coastal habitats of Bon Secour Refuge include uplands such as beach/dune, grassland, strand, and maritime hammocks, as well as wetlands such as tidal marshes. Each habitat is shaped by strong and consistent winds, saltwater spray, and sun. Typical beach/dune vegetation includes sea oats, cordgrass, sand spur, dune panic grass, and morning glory. Coastal grasslands include muhly grass, bluestem grasses, and sea oats, as well as occasional shrubs such as wax myrtle and groundsel. Coastal strands and maritime hammocks include shrub and tree species that are tolerant of wind and salt spray, such as saw palmetto, sand live oak, cabbage palm, yaupon, sea grape, and prickly pear. Tidal marsh habitats include grasses, rushes, and sedges along low wave-energy wetlands and river mouths. Typical species include black needle rush, smooth cordgrass, and saw grass.

With the exception of a few species, no data exist relative to many species' occurrence, status, and distribution on the refuge. A need exists for basic biological surveys and monitoring for rare taxa and plant communities.

### *PHYSICAL ENVIRONMENT*

The refuge is located along the Gulf Coast of Alabama and the Mobile Bay Estuary. The Mobile Bay watershed includes 65 percent of the State of Alabama, and portions of the States of Mississippi, Georgia, and Tennessee.

Refuge lands are a fragile combination of barrier islands, low-lying marshes, and highly erodible mainland shores. In addition to sea-level rise, winter storms, and altered sediment supplies, hurricanes frequently damage or destroy the human developments and infrastructure that line the coast. In 1992, Hurricane Andrew, and in 1995, Hurricane Opal, caused billions of dollars in losses. Even with more accurate predictions of large storm events, people continue to build homes within the flood plain and along the coastline. Between 1990 and 2000, the population in Baldwin County increased by more than 50 percent (Mobile Bay National Estuary Program 1999).

Frequent and large storms rejuvenate the barrier ecosystem. The refuge is part of an unstable land mass, constantly shifting and moving due to the frequent hurricanes that pummel the coastal area of the Fort Morgan Peninsula. Ecological forces of the Gulf Coastal Plain include disturbances such as fires, winds, tornadoes, and floods.

The timing of the flows throughout this watershed has been altered over the years by flood control projects and agricultural diversion. Water quality is significantly impacted by agricultural and

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municipal runoff. Rivers and water bodies throughout this area support a small fraction of the once abundant aquatic resources.

The climate of the refuge is characterized by warm, humid summers and relatively mild winters. Average maximum summer temperatures vary from the high 80s to low 90s Fahrenheit. During winter months, freezing is not uncommon, and temperatures less than 19 degrees Fahrenheit can occur. Annual precipitation ranges from 52 to 64 inches along the coast. The central Gulf Coast also has one of the highest frequencies of hurricane landfalls in the nation. The bay is additionally influenced by tidal changes that average a little less than 1. feet throughout the year. All of these factors, combined with highly variable river flows, contribute to a hydrology that is dynamic, complex, and necessary to support the variety of plants and animals existing in the Mobile Bay Estuary.

*REFUGE ADMINISTRATION AND MANAGEMENT*

**Land Protection and Conservation**

In the 1970s, development along the sugar sand beaches of Alabama rapidly expanded. What was once considered nothing but sand became prime real estate as venture capitalists began marketing the Gulf Coast as a tourist destination. In 1979, Hurricane Frederic slammed into Gulf Shores and destroyed 80 percent of existing residential development, facilitating the advent of high density residential development in the form of condominiums. A proposal to develop 1,200 acres with 8,000 feet of Gulf frontage and 22,000 feet of lagoon frontage was met with substantial resistance by the local community, local government officials, environmental activists, and the scientific community. In 1980, Congressman Jack Edwards introduced legislation to establish Bon Secour National Wildlife Refuge, which would protect a total of 10,000 acres. Additional legislation was passed to add what would become the Sand Bayou Unit, increasing the refuge acquisition boundary by approximately 2,000 acres. The first two tracts identified for inclusion in the refuge were the Perdue (1,290 acres) and Little Dauphin Island (850 acres) tracts. Table 1 presents the acquisition history of Bon Secour National Wildlife Refuge.

**Table 1. Acquisition history for the Bon Secour National Wildlife Refuge, Baldwin and Mobile counties, Alabama.**

<b>Year</b>	<b>Acreage Acquired</b>	<b>Year</b>	<b>Acreage Acquired</b>
<b>1981</b>	2060.86	<b>1993</b>	137.99
<b>1982</b>	107.23	<b>1994</b>	1698.67
<b>1983</b>	323.00	<b>1998</b>	150.00
<b>1984</b>	1330.18	<b>1999</b>	52.33
<b>1985</b>	251.95	<b>2000</b>	123.06
<b>1986</b>	14.47	<b>2001</b>	10.30
<b>1987</b>	16.67	<b>2002</b>	34.23
<b>1988</b>	386.52	<b>2003</b>	144.00
<b>1990</b>	136.62		
<b>Total</b>			<b>6978.08</b>

Throughout its history, the refuge has repeatedly emphasized land acquisition as a conservation priority, depending on available acquisition funding. There have been two major periods of acquisition in the early 1980s and mid-1990s. Since the original Land Protection Plan was adopted in 1985, three boundary expansions have been approved in 1990 (37 acres), 2001 (587 acres), and in 2003 (14 acres). The current acquisition boundary is 12,570 acres. To date, only 6,978 acres within the acquisition boundary have been acquired. This represents a significant shortfall. Table 2 presents current refuge acreages and the methods used to protect the properties.

The remaining inholdings have been classified into five priority categories. Per policy, the Service will acquire land within the acquisition boundary from willing sellers. Subject properties will be appraised by a Service-contracted independent appraiser and are subject to review by the Service's Regional Office Realty Review Appraiser before a fair-market offer can be made. Table 3 presents priority properties targeted for inclusion in Bon Secour National Wildlife Refuge. The priorities were set based on: 1) critical habitat for the Alabama beach mouse; 2) secondary habitat for beach mouse; 3) large, contiguous, undeveloped tracts; and 4) wetlands. The importance of wetlands lies not only in the variety of fish and wildlife depending on them, but also in the vital functions they provide for the benefit of the ecosystem, as well as the human population. Examples of these functions are floodwater storage and flood protection for downstream areas, water purification through removal of suspended sediments and pollutants, and groundwater recharge. Three different types of wetlands have been identified within the refuge acquisition boundaries: depressional (located in a depression in the landscape and generally draining only a small area); fringe (located near a large body of water and receiving regular two-way flow); and riverine (primarily fed by a river or stream). Figures 11-14 show the distribution of those wetlands in relation to refuge boundaries. This information is not currently available for the Little Dauphin Island Unit.

**Table 2. Land acquisition figures and acquisition strategies employed for the Bon Secour National Wildlife Refuge through October 2003.**

Protection Strategy	Acres
Land Transfer	32
Donation	135
Fee Title Purchased	6,236
Lease Agreements	575
<b>Total</b>	<b>6,978</b>

Key partnerships have facilitated the refuge's acquisition thus far. The first tract (Perdue) was acquired with the assistance of The Nature Conservancy. To date, the Conservancy has assisted with the acquisition of more than 3,000 acres. Other organizations that have been instrumental in land protection efforts include The Conservation Fund, Alabama Coastal Heritage Trust, Sierra Club, Mobile Bay Audubon Society, and Tonsmeier Properties. Relationships with these individuals and organizations need to be expanded if acquisition goals are to be met. Escalating land prices and speculative high-density development are impediments to the refuge achieving its acquisition goals and being able to provide quality habitat for many wildlife species.

**Table 3. Prioritized acquisition acreage (habitat) and estimated values for the Bon Secour National Wildlife Refuge.**

Type		Acreage	Estimated Value
<b>Priority 1</b>	Alabama beach mouse Critical Habitat (fee title and transfer from BLM)	50	\$4,000,000
<b>Priority 2</b>	Alabama beach mouse Secondary Habitat	10	1,500,000
	Large, contiguous tracts	1,356	5,800,000
<b>Priority 3</b>	Wetlands/Other	130	430,000
<b>Total</b>		<b>1,546</b>	<b>\$11,730,000</b>

In addition to fee title acquisition, the Service needs to explore non-traditional protection strategies, such as lease agreements and conservation easements. With land prices currently at \$70,000/acre for small lots, \$15,000-\$20,000/acre for large parcels, and \$6,000/foot for beach front lots, these strategies may represent the only viable options to protect the remaining tracts.

**Education and Visitor Services**

Bon Secour Refuge supports five of the six priority public uses identified for refuges: wildlife observation, wildlife photography, environmental education, interpretation, and fishing (Figure 15). Due to the fragmented habitat, endangered species issues, high visitation, lack of big game species, and proximity to densely populated areas, hunting is not appropriate for these lands and waters. Environmental education efforts on the refuge have been minimal at best due to staff size and higher priority projects. However, recent management emphasis was shifted to providing more outreach and educational programming for students. Currently, the main environmental education programs occur during the sea turtle nesting season. Approximately 200 volunteers are trained each summer. Throughout the year, scout troops and boys and girls clubs visit the refuge on a sporadic basis. The staff responds to requests, but do not advertise student programs due to a lack of facilities and staff to support such visits on and off the refuge.

In 2003, programming for winter visitors known as ■snowbirds• began and was extremely popular and successful. With minimal advertisement, refuge volunteers, who led interpretive tours, were overwhelmed by the response. An average of 40 people attended each tour. The key to being able to provide these programs is the availability of trained volunteers to lead them. In the future, refuge staff should expand these opportunities.

Figure 11. Wetland Resources, Perdue Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama

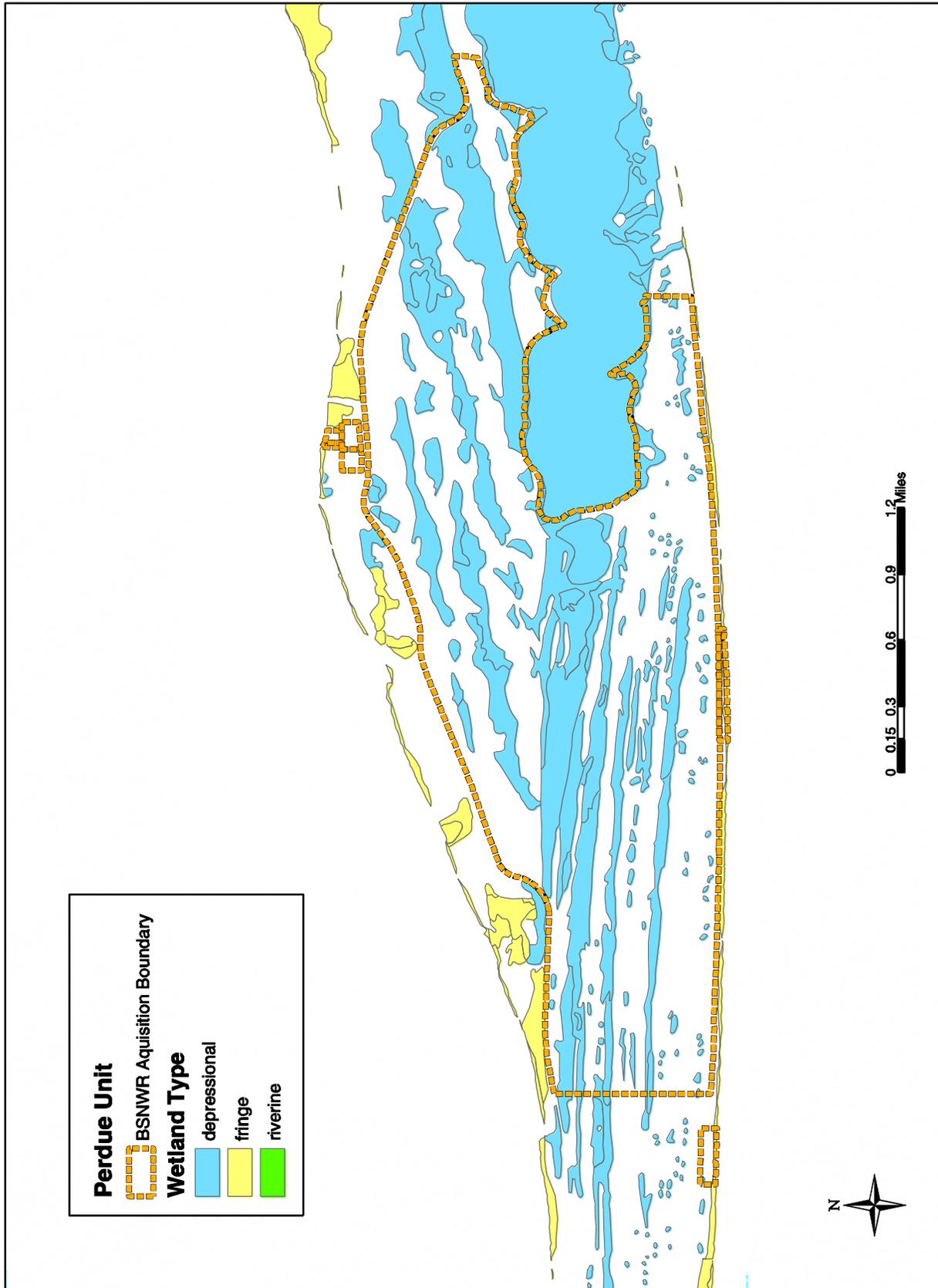


Figure 12. Wetland resources, Sand Bayou Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama

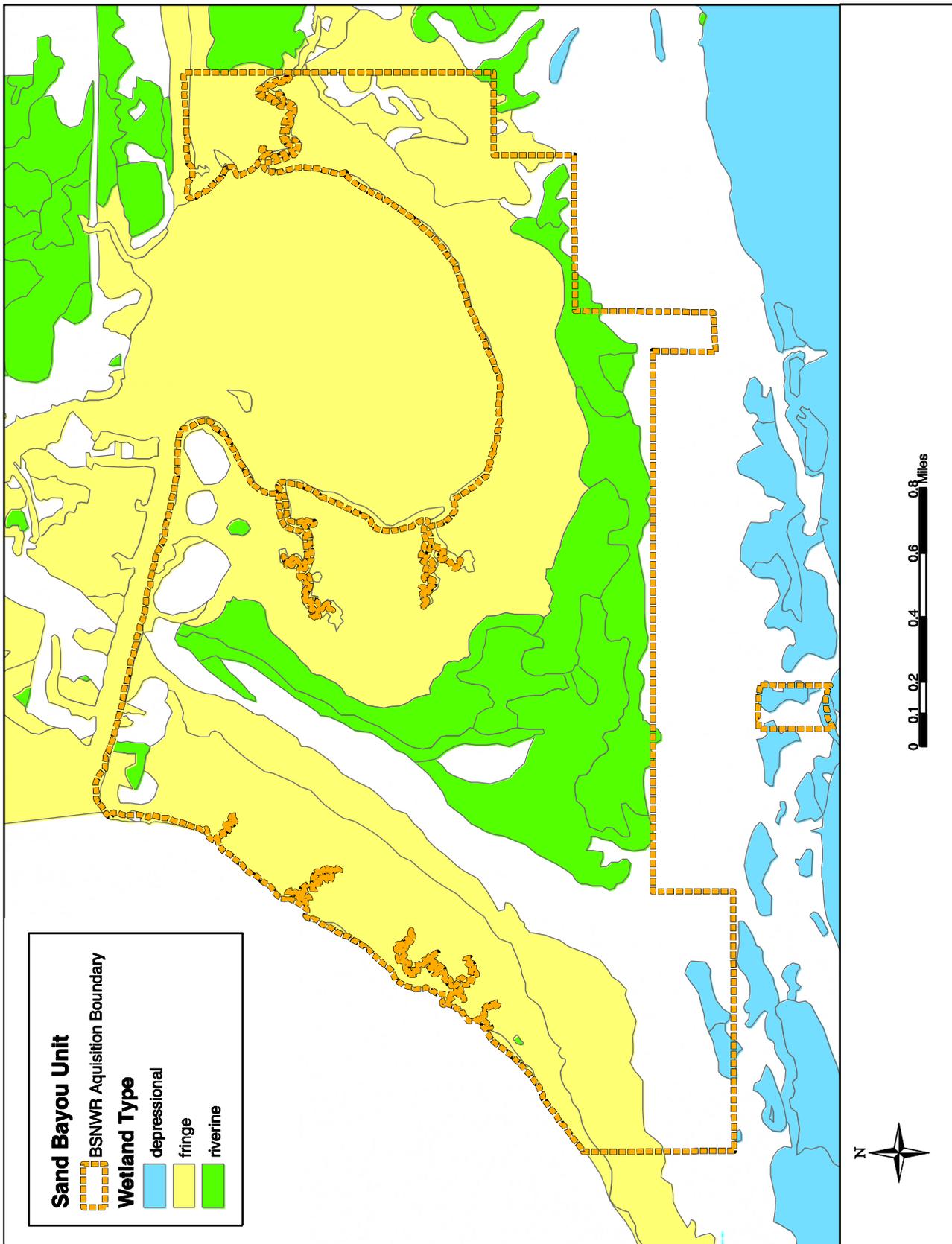


Figure 13. Wetland resources, Little Point Clear Unit, B on Secour National Wildlife Refuge, Baldwin County, Alabama

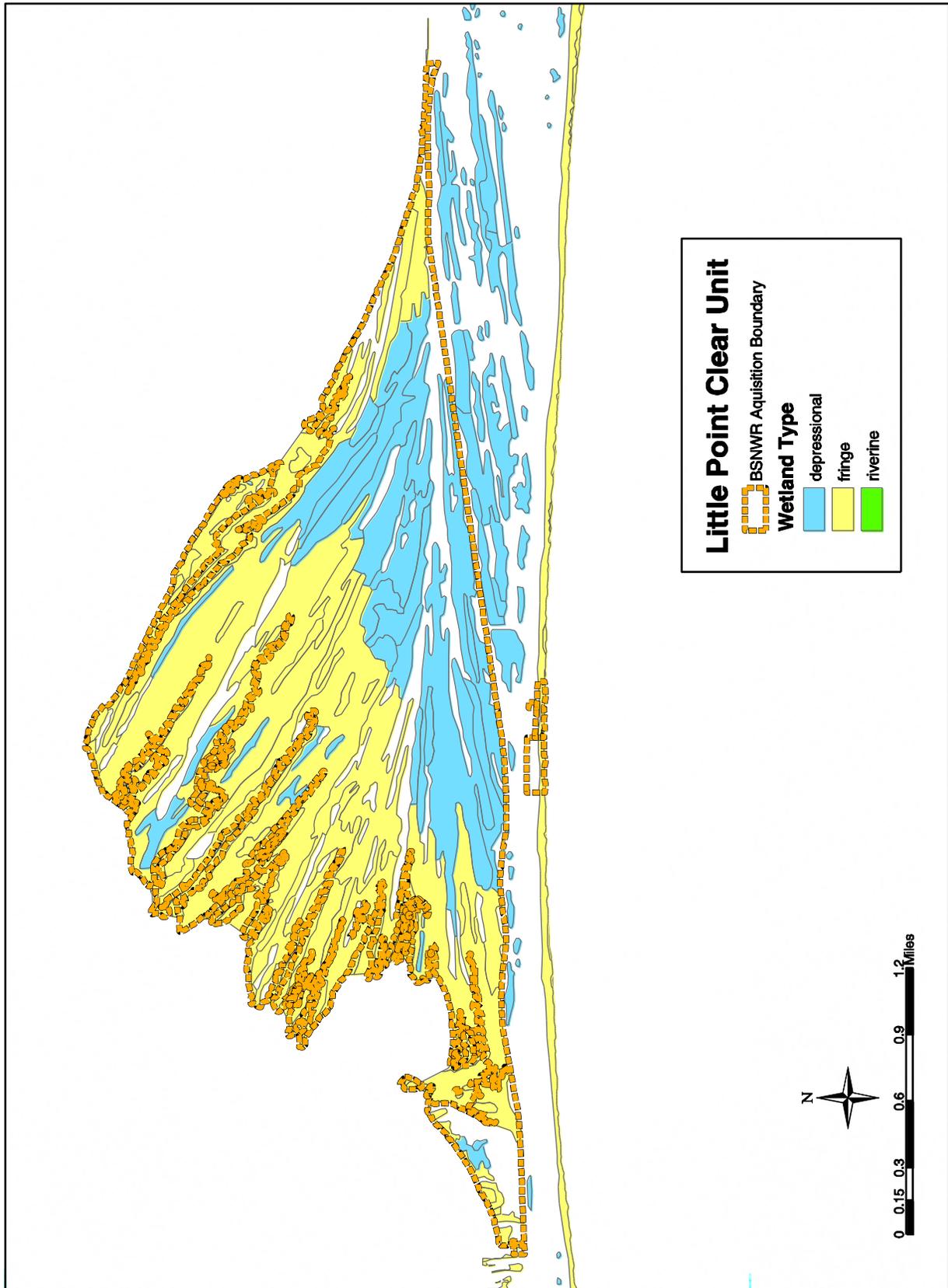


Figure 14. Wetland resources, Fort Morgan Unit, Bon Secour National Wildlife Refuge, Baldwin County, Alabama





The refuge hosts more than 98,000 visitors annually (Alabama Gulf Coast Convention and Visitors Bureau, unpubl. data, 2002). Visitor services include a visitor contact station with a small educational display area. The displays are homemade and lack consistency with the Service's design standards. Approximately 25,000 people visit the refuge office annually. Three developed trails are available in the Perdue Unit, highlighting dune, swale, wetland, maritime forest, and scrub habitats. Unmarked trails in the Sand Bayou and Little Point Clear units are sporadically used by birders and nature enthusiasts who know about them. Kayaking is becoming a popular activity in the Little Lagoon, Gator Lake, and the many bays and finger sloughs that surround the Sand Bayou and Little Point Clear units of the refuge. There are no boat launching points in these units. To access Little Lagoon, kayaks and canoes must be portaged 1/4-mile, while access to Gator Lake requires a portage of 1 mile.

Interpretive displays include small kiosks at the Jeff Friend Trailhead and at Gator Lake. A larger kiosk with newer displays is located at the Pine Beach Trailhead. Parking facilities are located at both trailheads and at the Mobile Street Dune Walkover. Additionally, there is an overflow parking lot near Mobile Street. Additional parking is needed for the Gator Lake Trail and seasonally for beach access, but may not be feasible since this is occupied, undisturbed Alabama beach mouse habitat.

Saltwater surf fishing is available in the Perdue and Fort Morgan units of the refuge. Target species include bluefish, redfish, Spanish mackerel, speckled trout, and flounder. Saltwater species also occur in the Little Lagoon and Gator Lake (40 acres), and wading these areas is a popular past time. Gator Lake also contains freshwater species, such as bluegill and bass, but fishing success is limited. Fishing opportunities in Gator Lake need to be improved if this resource is to be available to visitors. The staff has fielded many complaints in the past as the lake is relatively inaccessible due to phragmites and other emergent vegetation crowding the banks. Anglers are reluctant to wade in the murky water of a pond named Gator Lake.

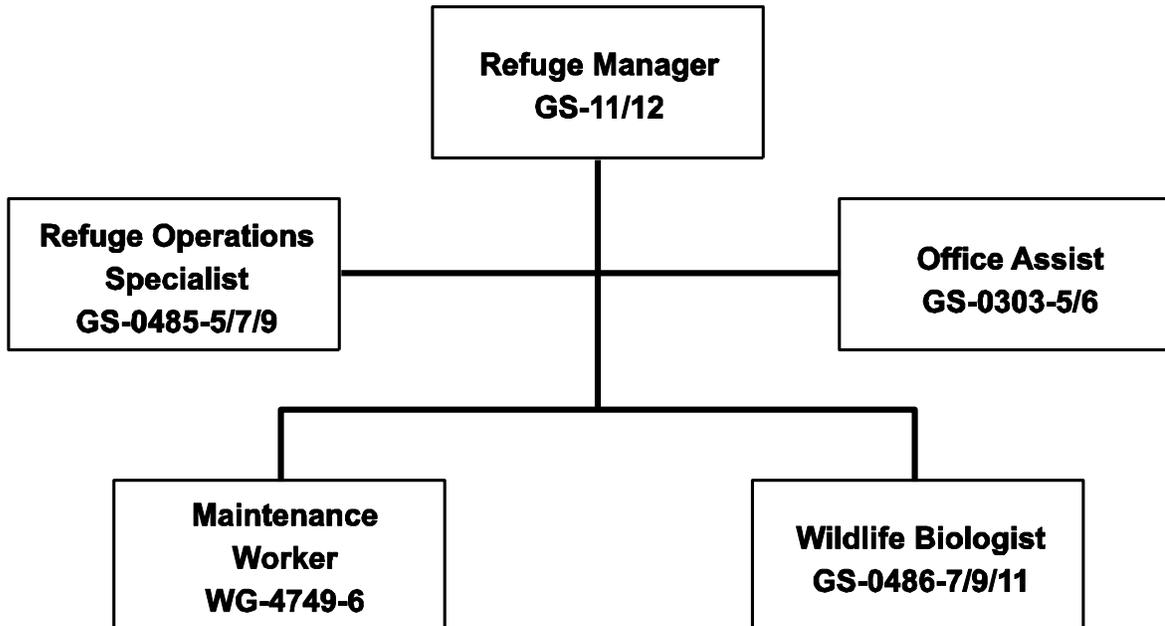
### Personnel, Operation, and Maintenance

Refuge administration refers to the operation and maintenance of refuge programs and facilities, including construction. The refuge has five permanent employees and receives substantial assistance from volunteers, interns, and Student Conservation Associates (Figure 16). Since its establishment, the refuge's staff has fluctuated between zero and five employees. During tight fiscal years, positions were left vacant in order to save operational expenses. At other times in its history, the refuge was complexed, mainly for administrative reasons, with Mississippi Sandhill Crane and Grand Bay National Wildlife Refuges. Table 4 summarizes the operating and maintenance funding received for 1999-2003. Periodically, special funding for endangered species recovery projects is available.

**Table 4. Funding for Bon Secour National Wildlife Refuge, Fiscal Years 1999-2003.**

Category	FY1999	FY2000	FY2001	FY2002	FY2003
Operations	122,800	102,300	226,000	257,300	269,900
Maintenance	79,300	10,300	48,700	118,300	106,300
Endangered Species	2,000	3,000	0	0	20,000
Restoration	0	73,700	0	0	0
Quarters	0	0	0	0	11,400
Construction	93,800	58,700	33,400	0	0
<b>Total</b>	<b>297,900</b>	<b>248,000</b>	<b>308,100</b>	<b>375,600</b>	<b>407,600</b>

**Figure 16. Organization chart, Bon Secour National Wildlife Refuge**



The major management activities on the refuge include sea turtle nest monitoring and wildlife surveys, facility maintenance and boundary posting, and visitor services. The refuge has several key partnerships that support management objectives, including: Mobile Bay Audubon Society, Fort Morgan Historic Site, Baldwin County Museum Society, Alabama Gulf Coast Convention and Visitors Bureau, Gulf State Park, Share the Beach Sea Turtle Volunteers, and Friends of Bon Secour National Wildlife Refuge.

One type of facility that is often overlooked when thinking about refuge operations is living quarters. Because the refuge is located in a resort area, affordable housing is not easily available. However, the refuge has four residences and one bunkhouse that are available for refuge employees or for visiting students, interns, and professors. While this has enabled the refuge to host hundreds of students and several interns each year, as well as house refuge employees, it takes a significant amount of time and operational dollars to maintain these facilities. In addition to living quarters, Figure 16 shows other facilities that must be maintained for refuge management and visitor services programs. Currently, all constructed facilities and improvements are located in the Perdue Unit.

#### *SOCIAL AND ECONOMIC ENVIRONMENT*

The refuge currently consists of 6,978 acres within an approved acquisition boundary of 12,570 acres. The remaining 5,592 acres are in a combination of private-ownership and state-ownership lands as part of the Weeks Bay National Estuary Research Reserve. The refuge is located in unincorporated areas of Mobile and Baldwin counties. The nearest towns in Baldwin County include Gulf Shores (8 miles), Orange Beach (12 miles), and Foley (17 miles). The town of Dauphin Island is the nearest community to the Little Dauphin Island Unit in Mobile County. Mobile, the largest metropolitan area in either county, is 50 miles from the refuge.

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Much of the growth in these Gulf Coast counties traces to retirees who have migrated to the southern shore. (Alabama Gulf Coast Chamber of Commerce 2003). This movement has catapulted Orange Beach to the fourth fastest growing town in Alabama during the 1990s, with a growth rate of more than 200 percent from 1980 to 1990, and 68 percent from 1990 to 2000. In unincorporated Fort Morgan, where the refuge is located, the population has grown from 3,732 seasonal residents in 1988 to 4,876 seasonal residents in 1998. The projection for 2008 is 5,808 seasonal residents (Alabama Gulf Coast Chamber of Commerce 2003).

In both counties, the economies of the coastal areas are driven by tourism. While the permanent population of the Gulf Shores/Orange Beach area hovers around 10,000, it swells to 50,000 during peak tourist seasons. The area is home to more than 9,000 hotel rooms and condominium units. In Baldwin County, the area boasts 32 miles of sugar sand beaches and 15 golf courses. The coastal area of Mobile County contains 18 miles of beaches, but 9 miles are privately owned and closed to the public. Dauphin Island has one golf course and is characterized by single family rental homes and a few 4-story condominium towers. The average yearly temperature of 75 degrees Fahrenheit and average water temperature of 70 degrees Fahrenheit help to characterize the area as perfect for many tourists.

Demographics of refuge visitors reveal that 82 percent are college educated; there is a 1:1 ratio of males to females; 60 percent are couples between the ages of 35 and 54; and the average length of stay is 8-10 days, which translates into \$34 million in spending annually for the local economy (Alabama Gulf Coast Convention and Visitors Bureau 2003).

The refuge has three peak visitation periods: January-March; March-April; and June-August. From November through March each year, an estimated 280,000 snowbird visitors descend on Gulf Shores and Orange Beach to spend a mild winter on the shore. The resident population of these two cities and unincorporated Fort Morgan hovers around 10,000, so the influx of these visitors is a major contributor to the economy. On a marketing survey, nearly 14 percent of these visitors indicated that they visited Bon Secour Refuge. These visitors are generally midwestern couples who are educated, financially comfortable, and have identified wildlife and environmental values as some of the reasons for choosing this area for their winter home (Alabama Gulf Coast Convention and Visitors Bureau 2003).

During March and April each year, there are two types of visitors: Spring break revelers and birders. The number of visitors to the area during these three months is 240,000 and 13 percent of these visitors visit the refuge. Most of the visitors are families from southeastern states. During the summer, while the commercial beach areas host nearly 500,000 visitors, only 3 percent visit the refuge. In a 1995 survey, the refuge was not considered an attraction by visitors. The 2002 data (growth of 3 percent in summer visits and 13 percent in spring visits) exemplify the growing popularity of refuges and other natural areas, and clearly demonstrate that nature-based tourism is one of the fastest growing niche markets in the industry (Alabama Gulf Coast and Visitors Bureau 2003).

The refuge provides numerous benefits, including prevention of pollution in area waterways, improvement in air quality, protection of habitat for animal species, and recreational opportunities. If the Gulf Coast area is to remain a highly desirable destination for seasonal residents and tourists, the unique mix of nature-based attractions and golf courses, which together form green space, needs to be maintained. Refuge visitation needs to be carefully monitored and controlled to ensure that serious degradation of resources does not occur.

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## CULTURAL ENVIRONMENT

Very few systematic archaeological and historical investigations have been conducted on Bon Secour National Wildlife Refuge. Since its establishment in 1980, all archaeological investigations and historic building assessments have been conducted primarily to ensure compliance with Section 106 of the National Historic Preservation Act (Kanaski 1998; R Christopher Godwin and Associates, in prep.). An exception is the Baldwin County Archaeological Preservation Committee's investigation of the Ivanhoe, a 19th century Confederate blockade runner wreck (Franklin 1999 and Thompson 1997).

Earlier investigations were conducted by C.B. Moore, Walter Jones, and David DeJarnette. Moore examined sites at Seymour's Bluff, Shell Bank, and Bottle Creek in 1905. Jones recorded a number of precolumbian sites along Bon Secour Bay and Little Lagoon in the late 1930s and early 1940s (Alabama State Site Files n.d.). DeJarnette tested the Strong Bayou Site (1Ba81) in 1941-1942 (Kanaski 1998). Landforms that appear to have a high to moderate potential for archaeological sites include the shorelines of Bon Secour Bay and Little Lagoon. The archaeological potential of the beach ridges, or ridge and swale systems seen in the Perdue Unit, would appear to be moderate. However, recent archaeological investigations by Neilsen (2000a & b) and R. Christopher Goodwin and Associates (in prep.) did not identify any archaeological sites on the ridges. The active beach and dune zone along the Gulf Coast possesses very little potential for intact archaeological sites, except for shipwrecks, such as the Ivanhoe.

Curren (1976) noted the lack of evidence for Paleoindian-Middle Archaic occupations in the Gulf Shores area. Late Archaic groups sporadically used the area. Their sites appear to be limited to the higher elevations east and west of the delta and Mobile Bay. Curren suggested that geomorphic processes, such as sea-level fluctuation and a gradually sinking coastline, may have masked earlier sites. Considerable investigations have been conducted at more than 300 Woodland-Early Historic Period sites in the Mobile Bay and Delta region. The sites range from shell middens consisting of oyster (*Cassostrea virginica*) or marsh clam (*Rangia cuneata*), sand mounds, village middens accompanied by mounds, and 18th- and 19th-century forts. In the delta region, Woodland Period sites are located above the 50-foot contour and along the Gulf Coast's shore on the southwest side of the bay. Mississippian sites are located predominately on sand spits at the bay's mouth and on the Gulf Coast. In such estuarine habitats, fresh water is a critical variable for site location. A number of large sites are found near or by a river or small creek.

Soil fertility is another critical variable. Small floodplains along streams flowing into the bay offered fertile land for agriculture. Along the Gulf Coast proper, sites whose major occupations date to the Mississippian Period are found clustered on the long and narrow freshwater lakes. The Mississippian groups exploited shellfish, fishes, aquatic reptiles, and white-tailed deer in the rich marine and estuarine habitats. The most frequent invertebrates seen in shell midden sites are oyster and marsh clam. Shell midden sites in the central and lower bay areas, including those on the sand pits at the mouth of the bay, consist primarily of oyster. Shell midden sites comprised primarily of marsh clam occur in the central bay and the delta region. In the southeast section of the bay, marsh clams were collected from the freshwater/brackish water lakes.

At the time of European contact, Mobile Bay was the home of the Tomeh (Tohome) and Mobile Indians. Knight (1984) believes these historic groups descended from the local, late prehistoric Pensacola complex groups. The groups' subsistence strategies included deltaic horticulture and seasonal hunting, fishing, and gathering. Seasonal movement of villages and farmsteads occurred in conjunction with flooding of the delta. The Tomeh and Mobile Indians relied on isolated farmsteads with small tracts of arable soils where they grew maize, beans, and squash. The farmsteads were apparently associated with larger permanent villages located on the bluff which flanked the delta. Critical variables for site selection included access to arable and renewable delta soils, access to

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nearby flood-protected areas suitable for permanent habitation, access to tidal bays with tidal ranges suitable for fish weir technology, access to shellfish beds, and access to mast-bearing forests (Knight 1984). Waselkov and Gums (2000) provide a detailed description of historic Indians in the Mobile Bay area.

In the early 16th century, Alonso Alvarez de Pineda reported a large town near the mouth of Mobile Bay and 40 villages along the bay and river (Swanton 1946). By 1700, there were five villages associated with the Mobile, a sixth to the Little Tomeh. Refugee groups from northwest Florida (Apalachee, Chatot, and Tawasa) and west of the Bay (Taensa, Chitimacha, and Choctaw) fled to communities around the bay in the 18th century. This is reflected in the archaeological record by the diverse ceramic styles (Knight 1984).

Fort Morgan, a brick masonry fort, was constructed between 1819 and 1834, as part of Mobile Bay's defenses. The lighthouse, near the fort, was constructed in 1822. The 55-foot conical brick tower marked the entrance to the bay (Holland 1994). Mobile was one of the few major Gulf coast harbors remaining under Confederate control by 1864. The Union fleet, under the command of Admiral David G. Farragut, had blockaded the Gulf Coast, including Mobile, since 1860. Blockade runners, such as the Scottish built *Ivanhoe*, provided munitions and staple supplies to the Confederacy. The *Ivanhoe*, a clincher-plate ironhulled, steam-powered side-sheeler, ran aground southeast of Fort Morgan on her maiden voyage in June 1864. Troops from the nearby fort salvaged much of her cargo despite heavy bombardment from the USS *Glasgow*, USS *Metacomet*, and USS *Mongahela*. Union troops boarded the *Ivanhoe* on July 6, 1864, and set fire to the vessel, in an unsuccessful attempt to destroy her (Thompson 1997, Franklin 1999, and Wise 1988). On August 5, 1864, Farragut's squadron sailed past Fort Morgan and engaged the *Tennessee*, a Confederate ironclad, and three gunboats. Within less than three hours, Farragut controlled the lower portion of Mobile Bay. However, Fort Morgan, Fort Powell, and Fort Gaines remained in Confederate hands and controlled the bay's entrance. Farragut landed troops under the command of General Granger approximately three miles east of Fort Morgan on August 9. By August 21, the Union troops and artillery were in position to begin their siege of the fort. On August 22, a coordinated bombardment of Fort Morgan began, breaching the fort's walls at several locations, setting its wooden buildings on fire, and disabling all but two of the Confederate guns. The fort was unconditionally surrendered to the Union forces on August 23 (Anderson 1962; Neilsen 2000a). The light tower was seriously damaged during the Union bombardment and a temporary light was placed on the fort's southwest bastion in 1864. The Lighthouse Board erected a 35-foot iron skeleton tower on the bastion in 1873. This tower was replaced in 1966 by the current steel skeleton tower (Holland 1994). A Taft-Endicott period battery was constructed adjacent to the fort between 1890-1910 (Lewis 1979). Pilot Town, which is located at Navy Cove on Bon Secour Bay, is the site of a middle 19th to early 20th century settlement. Navy Cove served as a resupply depot for American ships during the War of 1812, and later as a supply point for the Union's siege of Fort Morgan in 1864. A permanent settlement developed following the Civil War, but was destroyed by a storm surge from the Hurricane of 1906 (Warner 2003). Extensive archaeological and historical investigations have recently been conducted, but technical reports describing the fieldwork and its results are not yet available (Neilsen 2000b).

Neilsen (2000b) notes that post-bellum settlement of the Gulf Shores area was sparse. The Dixie Graves Parkway, also known as Fort Morgan Road, was opened in 1934. Sporadic residential development occurred primarily along the north side of the parkway. Today, much of southern Baldwin County's economy focuses on the recreational and resort industry.

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## *SIGNIFICANT RESOURCE THREATS AND PROBLEMS*

The greatest challenges posed for managing Bon Secour Refuge are declining populations of fish and wildlife species and loss of habitat to development, which accelerates species decline. To date, only 6,978 acres have been acquired by the refuge within the 12,570-acre acquisition boundary. Excepting state lands that fall within the Skunk Bayou Unit, that leaves more than 1,700 acres on the Peninsula that fall within the acquisition boundary, but are privately owned. This is considered a significant shortfall to fully implement the purposes legislated by Congress.

Coastal development, habitat fragmentation, introduction of exotics, recreation use, and suppression of natural fire represent the trends along the Gulf Coast and Fort Morgan Peninsula. Most of the lands outside, and some within the refuge's acquisition boundary, have been zoned as Two or Multiple Family Districts, or Local Business Districts (Figures 17 and 18), allowing for construction of not only private housing but also tourist accommodations, condominiums of up to 20 stories, and other facilities. The zoning designation indicates the number of units allowed per acre. For example, an R6 zoning would allow up to six residential units per acre, while an R4 zoning would allow up to four residential units per acre. A significant portion of the undeveloped land on the Fort Morgan Peninsula is zoned at these higher residential densities. Encroaching development has already led to significant declines in fish and wildlife populations, habitat degradation and elimination, wildlife/people conflicts, pesticide- and petroleum-based product accumulations in the water, pest management problems, and a need for increased law enforcement to administer recreation programs and habitat protection. The few areas that remain still in a relatively natural state, including those in private ownership within the refuge's acquisition boundary, are basically open to future development under the pressure of a rapidly growing tourist industry, resulting in further enhancement of present problems and conflicts.

Figure 17. Fort Morgan Peninsula zoning district

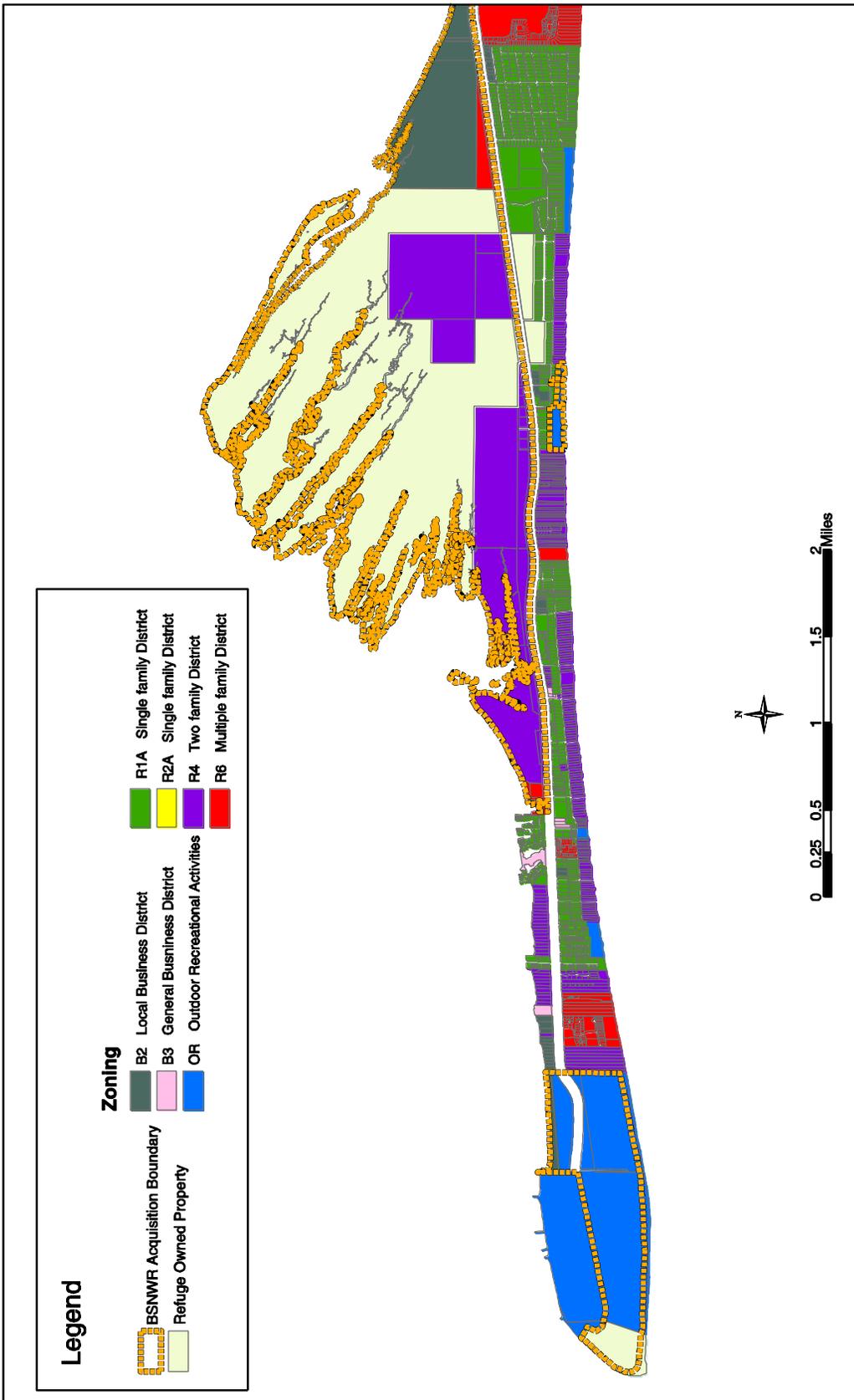
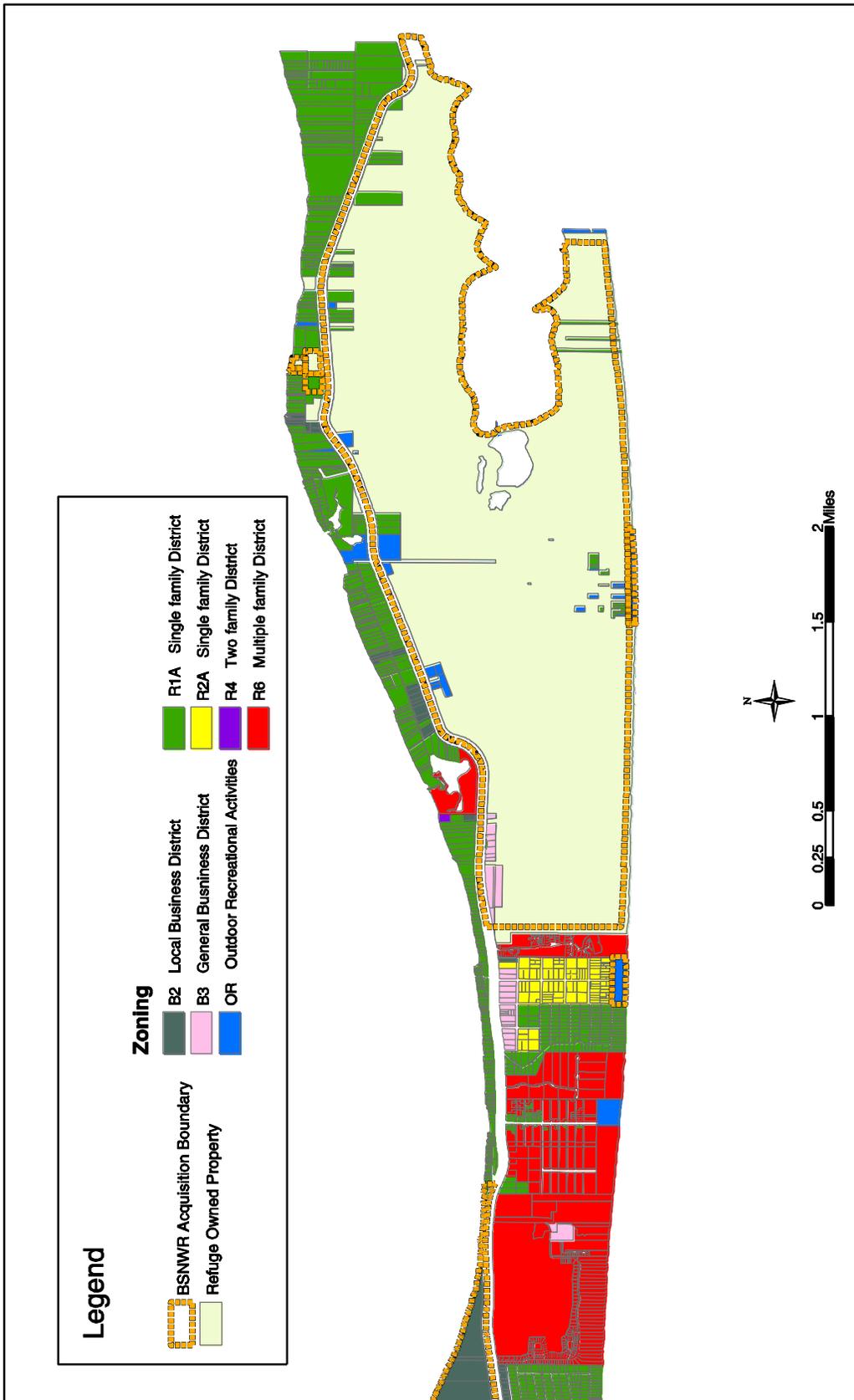


Figure 18. Fort Morgan Peninsula zoning district



Many of the refuge's significant resource problems and management challenges are reflected on a larger scale within the lower Mobile Bay watershed and Fort Morgan Peninsula. These problems, both individually and cumulatively, play a significant role in determining future conditions on the refuge. These resource problems and management challenges are briefly summarized in Table 5.

**Table 5. Summary of ecological threats and problems facing Bon Secour National Wildlife Refuge.**

Management Area	Management Issue or Concern
Upland Habitats	Changes in habitat composition and species diversity due to fire suppression; Management for the Alabama beach mouse comes at the expense of other species; Increase in exotic pest plant and animal species; Fragmentation due to ownership and zoning patterns; Increase in number and density of developments adjacent to the refuge and within the refuge boundary. Unauthorized access through the refuge from adjoining property.
Wetland and Coastal Habitats	Erosion at Little Dauphin Island Loss of submerged aquatic vegetation; Increase in exotic pest plant species; Accumulation of contaminant runoff due to increased use of pesticides and herbicides; Increased use of boats and personal water craft in Little Lagoon; Coastal armoring and improper use of sand fence or other dune building materials (e.g., hay bales). Lighting from human structures affects nesting and hatchling sea turtles
Recreation	Increase in public use of refuge without adequate staff and facilities to accommodate or manage that increase; Pressure to provide more facilities for the visiting public; Pressure to conduct more outreach to various parts of the community.
General Administration	Maintenance of numerous entrance points and facilities; Lack of a constant law enforcement presence; Lack of staff to conduct baseline surveys and monitoring; Pressure to support conservation measures off-refuge.

In 1985, the Fish and Wildlife Service listed the Alabama beach mouse as endangered. Encroachment of refuge boundaries from residential beach development and the subsequent increases in habitat fragmentation, human use of the beach, feral cats (pets), and exotic plant introductions (landscaping) continue to place the Alabama beach mouse at risk, resulting in island populations existing primarily on public lands. Therefore, elucidation of this species's habitat needs, viable dune management techniques, and potential visitor impacts on the dune system are vital for long-term conservation (Fish and Wildlife Service unpublished report 2001).

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The Bon Secour Refuge is an important site for contributing to sea turtle recovery. Removing impediments such as derelict sand fencing, managing coastal lighting, implementing measures to protect nesting females, nests, and hatchlings, and educating the public are important conservation tools used by the Service. The number of sea turtles that successfully nest on refuge beaches is influenced by various factors, including managing for reduced disturbance to nesting females and increasing survivorship of hatchlings until they enter the Gulf of Mexico.

Common problems associated with sea turtles include all-terrain vehicles, sunbathers disturbing nests, predation of eggs by feral pets, ghost crabs, foxes, and coyotes, and disorientation of hatchlings due to beachfront lighting.

The loss of habitat and wildlife to development and coastal encroachment, predation, off-road vehicles, invasive species, and natural, as well as human disturbance, poses a serious threat to migratory birds and resident species. Beach development has decimated migratory land bird populations throughout the Fort Morgan Peninsula. More than 30 species of breeding migratory songbirds are found in this region. Some of these species, such as prairie warblers, have declined significantly and need the benefits of secluded successional scrub habitat to recover and sustain their existence.

Factors such as hydrology, age class of trees, vegetative types, and proximity to residential and commercial development, require that planning at Bon Secour Refuge must be site specific, thus complicating the implementation of management practices. Recovery of longleaf pine and pine savanna communities via protection and management, as well as acquisition of private lands within the refuge's acquisition boundary, is a high priority for the Service. The two primary management methods associated with these habitats are hydrologic restoration and prescribed burning.

The refuge's coastal habitats and management units are five areas separated by residential homes, high rises, golf courses, and municipal development on the Fort Morgan Peninsula. Homes and high rise structures have mostly been developed after the establishment of the refuge. The Fort Morgan Peninsula is one of the fastest developing areas in the region. This growth has led to increasing wildland-urban interface challenges such as smoke management problems and reduced application of prescribed fire near urban areas due to public misperceptions. The altered fire regime due to inadequate and incompatible fire management, incompatible development, habitat destruction, and habitat succession continues to be a conservation threat to trust species and their viability.

Coastal armoring includes structures such as sea walls, rock revetments, and sandbags that are installed in an attempt to protect waterfront property from erosion. This hardening of the shoreline actually accelerates waterfront erosion, necessitating that adjacent properties also be armored to prevent further scouring and undercutting of those properties. Incompatible sand fencing for dune restoration is a common method of armoring along the Gulf side of the peninsula. These structures are located along the shoreline at nearby developments and if not constructed properly, block female turtles from reaching suitable nesting habitat.

Beach renourishment consists of pumping, trucking, or otherwise depositing sand on a beach to replace what has been lost to erosion. While it is preferable to coastal armoring, it can negatively impact sea turtles if the sand is too compacted for turtles to nest, or if the sand imported is drastically different from native beach sediments, thereby potentially affecting nest-site selection, digging behavior, incubation temperature, moisture content of nests, and gas exchange within nests. If renourishment is allowed to proceed during the nesting season, nests can also be buried far beneath the surface or run over by heavy machinery.

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Bon Secour Refuge is faced with the challenge of contributing substantially to off-refuge ecosystem objectives, such as migratory bird and threatened and endangered species management. These ever-increasing responsibilities, coupled with the current low levels of funding, make it difficult to meet the demand for biological services on and off the refuge. The refuge staff is also facing the challenge of managing an active and increasing visitor services program. The refuge provides limited recreation opportunities, but the demand makes it difficult to develop quality wildlife-dependent recreation opportunities involving the priority uses of fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Heavy use of beaches by the public, during a period broadly overlapping the breeding season of several species, results in one of the most serious natural resource management challenges that managers must work to resolve. Predicted increases in human use of the refuge lead to increased disturbance of beach nesting birds and sea turtles. Shorebird use of beaches during migration on the Little Dauphin Island and Fort Morgan units should be monitored to determine present status and the effect of recreational use on population levels.

Related to the increase in popularity of refuge beaches by residents and tourists is the observed trend of increased dog-related activities on refuge beaches and trails. According to the website [www.dogfriendly.com](http://www.dogfriendly.com), Bon Secour Refuge beach is the only public beach in Alabama that allows dog use. As other public lands in the area have prohibited pets from areas under their jurisdiction, more tourists and residents rely on refuge trails and beaches to exercise their pets. Coinciding with the increase in dog-use is a marked decline in the number of shorebirds utilizing refuge beaches for foraging, loafing, and nesting activities. While there is no direct evidence to suggest a correlation between these two trends, it is well-described in the literature that dogs can negatively affect shorebird use of areas where they are permitted. Dog-use of the refuge is a historic use and the appropriateness of this activity has never been addressed, nor have the effects on the endangered Alabama beach mouse, nesting sea turtles, and sea turtle hatchlings been determined. Public concern about the increase of canine feces on refuge trails, beaches, and boardwalks has grown, as well as concern about the number of unrestrained dogs since the majority of people using the refuge for this purpose choose to ignore the leash law. If left unchecked, this use may materially interfere with the purposes of the refuge and prevent implementation of several management objectives.

The development of baseline data is a task expected to take years for present staff to accomplish. The refuge system policy requires inventories of plants, fish, wildlife, and habitats. Monitoring of critical parameters and trends of selected species and species groups, as well as the subsequent basing of management on sound data, continues to be a problem due to staffing constraints. No standard inventory and monitoring method is in place to monitor conditions and impacts. Fish, reptile, and amphibian conservation is overlooked because of lack of information and limited funding to manage these resources.

The coastal habitats, long growing season, abundant rainfall, and geographical proximity to the Mobile Bay and the Gulf of Mexico are critical to migratory birds, threatened and endangered species, and other wildlife. The refuge location and habitat features are significant ecological niches for the conservation of many trust and resident species. The refuge is home to a wide variety of amphibians, reptiles, mammals, and birds and is well known locally and nationally for its wildlife. Conservation of the Alabama beach mouse, loggerhead sea turtle, nongame migratory birds, and several other species of management concern is the primary focus of the current refuge staff.

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With encroaching development, invasive species such as Chinese tallow trees and cogon grass are expanding onto refuge lands. Current known locations are along refuge roads and trails. Without control, these species will spread into the refuge interiors, degrading habitat for the Alabama beach mouse, 370 species of birds, and a variety of herpetofauna. Eradication in the early stages of infestation is vital in order to combat the continued spread of these species.



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## *III. Plan Development*

### **INTRODUCTION**

In accordance with Service guidelines and National Environmental Policy Act recommendations, public involvement has been a crucial factor throughout the development of this Comprehensive Conservation Plan for Bon Secour 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 Bon Secour 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.

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

Preparation for the comprehensive conservation plan began with a Biological Review in November 2000 and a Public Use Review in June 2001, both of which provided recommendations for the management direction of the refuge. The following paragraphs summarize the efforts taken to solicit public input and present the results of the public consultation process. A detailed description of that process is presented in Appendix IV.

On February 19, 2003, the first of a series of public meetings was held in Gulf Shores, Alabama. A planning team was formed to identify issues and concerns regarding the refuge, its wildlife, habitats, and management. The planning team consisted of the refuge manager, refuge biologist, a refuge planner, and an outreach specialist from the Daphne Ecological Services Field Office. Non-Service members of the planning team included:

- Director - Fort Morgan Historic Site
- Executive Director/CEO - Alabama Gulf Coast Convention and Visitors Bureau
- Vice Chair, Conservation and Natural Resources Committee - Alabama Gulf Coast Chamber of Commerce
- President - Friends of Bon Secour National Wildlife Refuge
- Chief, Coastal Section, Division of State Lands - Alabama Department of Conservation and Natural Resources
- Education and Outreach Coordinator, Coastal Section, Division of State Lands - Alabama Department of Conservation and Natural Resources
- Scientific Coordinator - Mobile Bay National Estuary Program
- Baldwin County Extension Agent (Environment and Marine Resources)
- Park Superintendent - Gulf State Park
- Park Naturalist - Gulf State Park
- Nongame Biologist - Alabama Department of Conservation and Natural Resources
- Executive Director - Dauphin Island Sea Lab
- Past President - Fort Morgan Civic Association
- Coastal Programs Coordinator - The Nature Conservancy of Alabama
- Private property owner within the refuge boundary

Further meetings were held from March through June 2003 to provide continuous information to the public and solicit further input. Efforts were taken to widely announce public meetings by publishing dates, times, and locations in local newspapers, as well as on flyers distributed to everyone on the comprehensive conservation plan mailing list. A comment packet was designed to identify the importance of different refuge features and opportunities for the public, while also allowing for “free-hand” comments on values, issues, and concerns related to the refuge. This packet was available at all public meetings, at the refuge office, and at the Alabama Gulf Coast Convention and Visitors Bureau. It could also be requested via mail or e-mail. In addition, it was sent out to everyone on the mailing list, the sea turtle volunteers, and the Friends of Bon Secour National Wildlife Refuge. Out of an estimated total of 500 comment packets distributed to the public, 102 completed forms (approximately 20 percent response) were returned to the refuge. A summary of the responses is found in Table 6 and a complete analysis of the comment packet and results can be found in Appendix IV.

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

The planning team identified a number of issues 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, plus applicable local ordinances, regulations, and plans. The team also directed the process of obtaining public input through public meetings, open planning team meetings, comment packets, and personal contacts. The planning team reviewed comments received at public meetings and also evaluated responses from the comment packet. Several recurring themes were evident during this scoping process.

**Table 6. Summary of concerns reflected on the Bon Secour National Wildlife Refuge Planning Packet.**

<b>Items receiving the most support:</b>	<b>Items receiving the least support:</b>
conserving habitat for wildlife	providing more recreational opportunities
protecting threatened and endangered species	improving fishing opportunities
protecting the whole biological system	improving public use facilities
increasing law enforcement	improving refuge accessibility

### *FISH AND WILDLIFE POPULATIONS*

The rescue of stranded and injured wildlife was a concern voiced by several citizens during the public scoping phase of this planning effort. It was recommended that the various agencies and organizations along the Gulf Coast develop and implement a comprehensive stranding call list.

Some citizens suggested that the refuge design and implement scientifically based monitoring programs to document changes in plant and animal communities in response to habitat management. Another comment was for the refuge to identify and inventory current populations of plants (including submerged aquatic vegetation) and wildlife, and then determine which populations are in need of monitoring.

Some participants stated that the main emphasis of refuge management should be to protect threatened and endangered species. It was recommended that the refuge increase law enforcement to better protect wildlife and habitat.

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## *HABITATS*

A thorough understanding of refuge habitats and their associated plant communities is fundamental to sound habitat management. Many stakeholders understand this concept and consequently, several expressed a strong desire to enhance the refuge's biological program. Among other items, the participants recommended that the refuge:

- Manage or remove invasive species;
- Enhance beach preservation activities and erosion control;
- Improve native habitats for endemic plants and animals;
- Map and type plant communities; and
- Play a more effective role in the cooperative management of resources on Fort Morgan Peninsula and coastal Alabama.

## *RESOURCE PROTECTION*

Many stakeholders commented on the Service's need for continued land acquisition and negotiations with inholders. Special concerns included annexation by the city of Gulf Shores, potential zoning changes, and increased developmental pressures. It was suggested that the refuge coordinate with other agencies and organizations (e.g., Alabama Coastal Heritage Trust, Friends of Bon Secour National Wildlife Refuge, and Little Lagoon Group) to protect land through traditional and innovative acquisition methods.

Several comments were made regarding the problem of litter on the refuge. Some of the suggestions were to make trash containers, marked for refuge use only, available on the refuge; to encourage dog owners to remove pet litter; and to explore ways to remove storm debris from the beach.

## *ENVIRONMENTAL EDUCATION AND OUTREACH*

Overall, many participants expressed their desire for more public involvement to further promote understanding and appreciation of the refuge and the wildlife and habitat it supports. Suggestions were made to host an annual or semi-annual public meeting to provide information on refuge programs and opportunities, and to enhance communication through appropriate brochures, web sites, and signage. Some of the public comments also indicated a need to improve the current environmental education program and facilities in order to meet present and future demands. Suggestions for improvement of the environmental education and outreach programs included:

- Construction of an education/visitor center;
- Addition of staff and volunteers;
- Participation in research, monitoring, and restoration activities as a means to educate the public (i.e., hands-on learning);
- Education of the public on native landscaping and dune restoration techniques; and
- Strengthening of partnerships with other environmental education programs in the area (e.g., Weeks Bay National Estuary Research Reserve, Gulf State Park, Dauphin Island Sea Lab, Mobile Bay National Estuary Program, and Baldwin County Extension Service).

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## *PUBLIC USE*

Bon Secour Refuge provides a variety of wildlife-dependent recreational uses, including fishing, wildlife observation, wildlife photography, and environmental education and interpretation. To facilitate these uses, a system of parking lots, trails, and interpretive structures has been developed. Some comments indicated a need for more extensive interpretation of the ecological and cultural resources of the refuge, including an expansion of the refuge's web site, improvement of maps and their distribution, and improved signage on the refuge. Specific recreational concerns, issues, and opportunities are summarized:

- Desire to fish at night on the Fort Morgan Unit;
- Lack of fishing opportunities at Gator Lake;
- Degraded fishing and birding experiences in the western end of Little Lagoon and adjacent refuge lands due to an increase in motorized boat traffic and personal watercraft;
- Need to vary recreational uses among the five refuge units (i.e., some units should have more public use, while other units receive too much public use during certain times of the year);
- Recommendation to study current level of public use on the refuge and to determine the appropriate level of recreational activity for each refuge unit;
- Need for a new and improved trail system on the refuge, including canoe and kayak trails in different habitats (e.g., Sand Bayou and Little Point Clear units);
- Recommendation to construct observation platforms and elevated walking areas;
- Need to improve refuge parking areas, boardwalks, water access, and access to the beach;
- Need for a comfort station adjacent to the beach access at the end of Mobile Street;
- Recommendation to institute user fees for recreational activities; and
- Recommendation that the refuge coordinate with other local agencies in the development of bike, kayak, and canoe trails on Fort Morgan Peninsula.

On July 10, 2003, the planning team held another public meeting in Gulf Shores to present its vision and direction for the comprehensive conservation plan and to solicit additional public input. The public meeting also served as a venue to explain the refuge planning process, to introduce the planning team members, and to present the issues previously raised in the process. Approximately 50 people attended the meeting and several expressed their support of the planning effort and direction.

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## *IV. Management Direction*

### **INTRODUCTION**

The Fish and Wildlife 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 National Wildlife Refuge System Improvement Act of 1997 is for the Service to maintain the ecological health, diversity, and integrity of refuges.

This plan contains the goals, objectives, and strategies for the next 15 years that will be used to achieve the refuge's vision.

Four alternatives for managing the refuge were considered: A - No Action (Current Management); B - Wildlife and Habitat Emphasis; C - Public Use Emphasis; and D - Wildlife and Habitat Management Enhancement While Optimizing Public Use. Each of these alternatives is described in the Alternatives section of the Environmental Assessment, which was prepared in conjunction with the Draft Comprehensive Conservation Plan. The Service chose Alternative D as its management direction.

Implementing this alternative will result in a greater public understanding and appreciation of fish, wildlife, and their habitats and in a higher quality, more evenly balanced recreational program for visitors. Partnerships will be expanded to benefit conservation efforts all along the central Gulf Coast to preserve, enhance, restore, and manage coastal barrier island habitat. If and when funding becomes available, additional staff and facilities will be added to accomplish objectives for establishing baseline data on refuge resources, managing habitats, providing opportunities and facilities for wildlife observation and photography, and providing educational programs that promote a greater understanding of refuge purposes and resources, as well as the unique values of Fort Morgan Peninsula and coastal Alabama. Under this alternative, the refuge will continue to acquire inholdings from willing sellers within the present acquisition boundary. Acquisition methods to be employed include: land transfers, fee title, partnerships with conservation organizations, conservation easements, and leases and cooperative agreements with state agencies.

An overriding concern reflected in this plan is that wildlife conservation is the first priority in refuge management. All public uses must be compatible with wildlife and habitat conservation. Appropriate wildlife-dependent uses such as fishing, wildlife observation and photography, and environmental education and interpretation will be emphasized.

### **VISION**

Bon Secour National Wildlife Refuge, which includes a diversity of flora and fauna, was established to preserve fragile barrier features along the rapidly developing Gulf Coast. The refuge is vital to the future of wildlife conservation in south Alabama and will protect habitats that are critical to the survival of threatened and endangered species, migratory birds, and resident native fish and wildlife. Refuge staff will identify, conserve, manage, enhance, and restore populations of native fish and wildlife species and the natural diversity, abundance, and ecological functions of refuge habitats while promoting conservation through innovative partnerships, private landowner cooperation, and existing land protection programs to complete acquisition within the approved refuge boundary. By managing a healthy refuge, the Service will also facilitate compatible public uses for school children, refuge neighbors, vacationing families, and residents. Partnerships with local communities, agencies, and citizens will be developed to increase public awareness of the environmental issues facing all partners and will foster stewardship of the natural and cultural

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resources found on the Fort Morgan Peninsula and in coastal Alabama. The envisioned future is one of increased staff and facilities, habitat restoration and protection, and involving people so they can enjoy the refuge as a rare and valuable resource.

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

The goals, objectives, and strategies addressed are the Service's response to the issues, concerns, and needs expressed by the planning team, the refuge staff and partners, and the public. These goals, objectives, and strategies reflect the Service's commitment to achieve the mandates of the National Wildlife Refuge System Improvement Act of 1997, the mission of the National Wildlife Refuge System, and the purposes and vision of Bon Secour National Wildlife Refuge. Depending upon the availability of funds and staff, the Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

### *GOAL 1: FISH AND WILDLIFE POPULATIONS*

Identify, conserve, manage, enhance, and restore populations of native fish and wildlife species representative of coastal Alabama, with special emphasis on migratory birds and threatened and endangered species.

**Alabama Beach Mouse.** Ensure the continued existence and long-term survival of the Alabama beach mouse on the refuge.

**Objective 1:** By 2006, implement monitoring protocol for the Alabama beach mouse.

Strategy:

- Monitor Alabama beach mouse populations through live-trapping conducted twice yearly during historically high (spring, February/March) and low (fall, October/November) population densities.

**Objective 2:** By 2010, develop and implement predator management plan for non-native species.

*Strategies:*

- By 2009, implement tracking surveys throughout Alabama beach mouse habitat to determine population trends of coyotes, red foxes, and feral and free ranging house cats.
- Conduct monthly tracking surveys to record predator species and relative abundance.
- As needed, implement trapping to remove coyotes, red foxes, and feral and free ranging cats.

**Sea Turtles.** Continue efforts to protect sea turtles and their nesting habitat on refuge beaches.

**Objective 3:** Annually monitor trends in nesting activity and evaluate nest success.

*Strategies:*

- During the nesting season, patrol refuge beaches daily with all-terrain vehicles to locate nests and non-nesting emergencies (i.e., false crawls) and record their locations.
- Following established protocol, excavate nests to evaluate hatching and emerging success.

**Objective 4:** Minimize disturbance to and maximize survivorship of nesting females, nests, and hatchlings on refuge beaches in a manner consistent with U.S. sea turtle recovery plans.

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*Strategies:*

- Mark all nests located during nesting surveys. Follow pre-determined protocol for marking nests.
- Relocate nests laid on or below the mean high tide line, as well as those located in flood-prone and active beach renourishment construction areas to a nearby suitable beach site (nests should be relocated no later than 9 a.m. on the morning following deposition).
- Exclude predators using management tools such as nest screening to minimize predation of eggs and hatchlings. Implement trapping if predation exceeds 15 percent.
- ■Turtle sit• nests when the potential for hatchling disorientation from beachfront lighting exists, and negotiate with businesses and individuals to manage their lighting to meet both sea turtle and human needs.

**Objective 5:** By 2005, assist with the establishment of the Service•s ■Share the Beach• program as a non-profit organization.

*Strategies:*

- Provide technical guidance to sea turtle volunteer program, ■Share the Beach•.
- By 2005, coordinate with Alabama Department of Conservation and Natural Resources to develop a statewide sea turtle monitoring protocol.

**Objective 6:** Continue to assist the National Marine Fisheries Service by participating in the Sea Turtle Stranding and Salvage Network.

*Strategies:*

- Record sea turtle strandings to contribute to an index of sea turtle mortality and to determine sources of mortality.
- Conduct daily sea turtle stranding surveys on the refuge from May to August (in conjunction with nesting surveys).
- Complete a Stranding Report for each stranded sea turtle and submit forms to the National Marine Fisheries Service on a weekly basis (report ■no strandings• when no turtles are found).
- Mark dead turtles with spray paint prior to appropriate disposal (removal/burial) to avoid multiple recordings of the same individual.
- Contact federal, state, and volunteer cooperators to assist with strandings of live turtles.

**Avifauna.** Initiate monitoring and conservation measures to provide habitat for transient, breeding, and wintering species of birds.

**Objective 7:** By 2008, develop and implement migratory songbird surveys on the refuge.

*Strategies:*

- Collect physiological and habitat use data for transient landbirds to measure responses to habitat management.
- Monitor population responses to habitat restoration using transect (migration monitoring) protocols to assess timing and extent of refuge use by migrants, and determine if this technique can be used to track responses to long-term habitat management.

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- Establish at least four transects of 2 km each, with one in Sand Bayou, one in Perdue along the Pine Beach Trail, one in Perdue along the dune ridge and swale system where experimental manipulations will occur, and one in the Little Point Clear Unit. Attempt to survey each transect weekly (or at least bi-weekly) during both spring and fall migrations.

**Objective 8:** Encourage and conduct research to determine specific responses to habitat management by assessing habitat quality (as measured by fat deposition and persistence) for migratory birds.

*Strategy:*

- Establish a series of long-term study plots in habitats that are managed in different ways, and collect appropriate data to determine responses to prescribed burning.

**Objective 9:** Monitor songbird populations and determine whether active management is necessary to improve nesting and wintering habitat components.

*Strategies:*

- Monitor songbird population responses to habitat restoration using the same (or similar) transects as for migration monitoring. Attempt to survey each transect 6-9 times per season from late April to early August, with alternating directions.
- Conduct point counts to monitor bird population responses to habitat restoration, focusing on breeding of yellow-billed cuckoo, yellow-throated vireo, and summer tanager.
- Establish 10 point count stations in oak/sand pine stands (both areas with and without active management) to monitor breeding bird populations with regard to possible increases in priority species populations.

**Objective 10:** Protect and enhance shorebird populations and habitats through appropriate management efforts recommended in the Southeastern Coastal Plain Shorebird Conservation Plan.

*Strategies:*

- By 2010, develop and implement a shorebird survey protocol. Consider application of the Manomet International Shorebird Survey.
- Determine total numbers of shorebird pairs by both terrestrial and boat surveys using Florida Fish and Wildlife Conservation Commission's Beach Bird Survey protocol.
- Identify shorebird roosts and ensure low disturbance at these sites.

**Objective 11:** Reduce disturbance to nesting and roosting shorebirds to create and protect quality habitats on the Little Dauphin Island, Fort Morgan, and Perdue units.

*Strategies:*

- Establish law enforcement presence to prevent disturbance of nesting birds and habitat during summer months.
- Discontinue allowing dogs on the refuge, as this use interferes with shorebird management strategies.

**Objective 12:** Protect and monitor wintering populations of piping plovers on the refuge.

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*Strategies:*

- Conduct surveys of piping plovers and habitat use on the Perdue, Fort Morgan, and Little Dauphin Island units.
- Monitor disturbance to piping plovers by refuge visitors.

**Objective 13:** Establish baseline database on marshbird use of coastal marshes during the next 15 years, with special emphasis on black and yellow rails, seaside and Nelson's sharp-tailed sparrows, raptors, and foraging wading birds.

*Strategies:*

- Following Secretive Marshbird Survey protocols, use playback at established points adjacent to marshlands to establish baseline survey for priority marshbirds (monitoring is not likely to be feasible).
- Establish survey points at sites supporting marsh and grassy habitats, with counts focusing on black rail, king rail, seaside sparrow, and least bittern in summer, and additionally on yellow rail and Nelson's sharp-tailed sparrow in winter.

**Objective 14:** By 2012, study the feasibility of developing a Hawk Watch Program for the refuge.

**Herpetofauna.** By 2007, survey amphibian and reptile populations on the refuge to monitor rare species and overall ecosystem health.

**Objective 15:** Assist in recovery efforts of the eastern indigo snake.

*Strategies:*

- Use funnel traps and drift fences to survey for eastern indigo snakes in spring and fall each year.
- Scope gopher tortoise burrows yearly during winter for hibernating eastern indigo snakes.
- Investigate the feasibility of reintroducing the eastern indigo snake in suitable habitat on the refuge.

**Objective 16:** Identify and survey suitable habitat for the gopher tortoise.

*Strategies:*

- Once habitat is established through use of growing season burns, perform ground searches for gopher tortoise burrows twice yearly (summer and winter).
- By 2014, scope gopher tortoise burrows twice yearly (summer and winter) to estimate gopher tortoise and eastern indigo snake populations.

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**Objective 17:** Establish surveys to determine the occurrence/abundance of reptiles on the refuge.

*Strategies:*

- Sample representative habitats for reptiles using drift fences, pitfall, and funnel traps in an array set-up on randomly selected sites on Sand Bayou and Perdue units. Drift fence arrays should be at least 30 feet in length with minimum 1 gallon size pitfall traps. Traps should be opened and checked for 5 consecutive nights twice yearly (April and September).
- Place two cover boards (4N x 4N x .0 CDX plywood) per drift fence site in Sand Bayou and Perdue units and check in conjunction with drift fences.

**Objective 18:** Sample habitats for amphibians seasonally using standard survey techniques.

*Strategies:*

- Establish routes for anuran call counts. Follow North American Amphibian Monitoring Program protocol.
- Survey for amphibians using drift fences and pitfall traps; to be accomplished in conjunction with reptile monitoring.
- Survey amphibians using cover boards as described under Objective 17.

**Data Management and Collection.** By 2007, build and maintain databases containing information on the biological resources of the refuge.

**Objective 19:** Organize and store mapping and biological resources data in a form readily accessible and easily disseminated to others per their request.

*Strategies:*

- Incorporate the use of global positioning systems and Geographic Information System to map priority animal species occurrences and to classify plant communities.
- Where possible, mimic data collection and storage in use by other Service field offices to facilitate data exchange.

**Objective 20:** By 2007, develop a Wildlife Inventory Plan.

## **GOAL 2: HABITATS**

Identify, conserve, manage, enhance, and restore the natural diversity, abundance, and ecological functions of refuge habitats and associated plant communities, with an emphasis on managing designated critical habitat for threatened and endangered species.

**Alabama Beach Mouse.** Manage dune and scrub/shrub habitat to maximize Alabama beach mouse habitat on the Perdue, Little Point Clear and Fort Morgan units.

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**Objective 1:** Manage the beach dune habitat to provide quality Alabama beach mouse habitat.

*Strategies:*

- By 2010, improve and restore the beach dune ecosystem through proper use of sand fencing, fertilizer, and re-vegetation if current research indicates these are beneficial.
- Construct sand fencing in a way that minimizes potential impacts to nesting sea turtles (i.e., 10 to 20 ft. sections at a minimum of 7 ft. apart).
- Maintain and adjust sand fencing routinely to maximize benefits considering prevailing winds and depth of fence.
- Remove derelict sand fencing immediately to prevent injury to humans and wildlife.
- Restore connectivity of secondary dunes in large unvegetated areas through the use of sand fencing and propagation of native beach vegetation.

**Objective 2:** Manage the scrub/shrub habitat to provide quality Alabama beach mouse habitat.

*Strategy:*

- Create beach mouse habitat through partial, manual clearing of scrub/shrub vegetation if research supports such action.

**Avifaunal.** Identify, manage, and enhance refuge habitats for a variety of avifauna, with an emphasis on habitats that support birds of conservation concern.

**Objective 3:** Promote and maintain shrubs that support fleshy-fruit and cover for transient landbirds.

*Strategies:*

- Determine the best long-term strategy to promote fleshy-fruited shrubs in forested and shrub/scrub habitats on 500 acres of the refuge within the next 15 years to support good and dependable stop-over habitat for transient landbirds.
- Promote fleshy-fruit producing shrub conditions through appropriate use of prescribed fire as described in the refuge's fire management plan.

**Objective 4:** Determine the best long-term strategy to promote and maintain shrub/scrub in forested understory and shrub/scrub habitats on 1,000 acres within the next 15 years to support good and dependable breeding habitat for common ground-dove, white-eyed vireo, and eastern towhee.

*Strategies:*

- Promote shrub conditions through appropriate use of prescribed fire.
- Restore complex vertical structure where necessary, favoring retention of remnant oak, and monitor response of associated bird community.

**Objective 5:** Within the next 15 years, restore 1,000 acres to a more diverse structure favoring shrub/scrub patches with occasional patches of grassy-herbaceous dominated ground cover.

*Strategy:*

- Reduce stocking where necessary and encourage shrub/scrub understory.

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**Objective 6:** Ensure that high quality foraging and roosting habitat is provided for migrating and wintering shorebirds and black terns at Little Dauphin Island, Fort Morgan, and Perdue units.

*Strategies:*

- Support high quality foraging, migration, and wintering habitat by reducing disturbances and maintaining washover habitat, as called for in the Southeastern Coastal Plain Shorebird Conservation Plan.
- Establish law enforcement presence to reduce disturbances to foraging habitat.
- Determine whether each washover and dune blowout site can be left alone (not in conflict with other resources) and avoid beach restoration as much as possible.
- Once management direction is determined, follow habitat changes with surveys to determine response by shorebird species.

**Plant Communities and Forest Management.** Identify and maintain a diversity of native plant communities on the refuge, including forested systems.

**Objective 7:** Determine types of plant communities on the refuge and perpetuate those that historically occurred in the area.

*Strategies*

- In collaboration with Alabama Department of Conservation and Natural Resources, Heritage Trust Division, commission a survey of plant communities. Identify those requiring special management considerations, such as those that are unique or rare.
- Determine the historical fire regime for refuge plant communities and, to the extent practical, emulate those historical regimes unless there is a special need to do otherwise (e.g., to maintain a threatened/endangered species).
- By 2008, working with the Regional Fire Ecologist, develop conservation strategies for fire-adapted communities.

**Objective 8:** Maintain forest structure that will optimize habitat for gopher tortoises and eastern indigo snakes and provide stopover habitat for neotropical migratory birds in the forest stands located on the side slopes of the Sand Bayou Unit.

*Strategies:*

- Reduce basal area on 400 acres of ridge top forest to regionally acceptable levels which will provide optimum habitat for gopher tortoises and eastern indigo snakes.
- Use timber sales or other silvicultural techniques, as appropriate, to return stands to an open condition by 2013, which will benefit gopher tortoises and eastern indigo snakes.
- Prepare a Forest Management Plan for the refuge.
- Develop silvicultural prescription for manipulation of forest stand to improve gopher tortoise and eastern indigo snake habitat.
- Contract for felling of trees either commercially or non-commercially.
- Manage feral hogs by using trapping.

**Objective 9:** Continue to implement refuge prescribed burning program to optimize wildlife habitat (see Fire Management Plan).

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**Objective 10:** Eliminate invasive cogongrass on the refuge.

*Strategies:*

- Inventory cogongrass distribution on the refuge.
- Control cogongrass using herbicides during appropriate season based on U.S. Department of Agriculture's research and other research.

**Objective 11:** Control invasive Chinese tallow trees on the refuge.

*Strategies:*

- Inventory Chinese tallow tree distribution.
- Apply herbicides to Chinese tallow trees using acceptable methods and timing.
- Use prescribed fire to control Chinese tallow trees.

**Habitat Research and Planning.** Conduct research to aid in the implementation of habitat management actions on the refuge.

**Objective 12:** Determine impacts of prescribed fire on migrating songbirds and their habitat.

**Objective 13:** Develop a study to determine changes in plant and avifaunal communities in the black needlerush marsh following treatments of prescribed fire.

**Objective 14:** By 2005, develop a Habitat Management Plan.

### *GOAL 3: RESOURCE CONSERVATION*

Identify and conserve archaeological and natural resources on Bon Secour National Wildlife Refuge and promote conservation through interagency and private landowner cooperation, partnerships, and land protection programs on the Fort Morgan Peninsula and coastal Alabama.

#### **Archaeological Resources**

**Objective 1:** Conduct a refuge-wide archaeological survey within the next 15 years.

*Strategies:*

- By 2008, develop a scope of work for a comprehensive archaeological survey and for geomorphic investigations of the refuge, as well as cost estimates and ranking factors for contractor selection (Regional Archaeologist). Try to secure funding by 2010.
- Continue to collect location information on historic properties by interviewing long-time residents and others familiar with the history of the area.
- Develop a GIS layer for the refuge's archaeological and historic sites. The archaeological/historic layer will mesh with such existing layers for habitat type, vegetative cover, hydrology, and soils being developed by the refuge staff. Layer parameters will be defined by 2006 (Regional Archaeologist). 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.

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- Integrate cultural resource preservation into refuge management plans such as Fire Management, Habitat Management, etc., to protect cultural resources in perpetuity.
  - By 2006, procure pertinent scientific reports and articles and produce an annotated bibliography to document the region's history, geomorphology, and the utility of the scientific methodology.
  - Catalog refuge artifacts and historic documents and assure appropriate archival.
  - By 2015, complete an Archaeological Resources Protection Plan to protect and conserve archaeological sites.

**Objective 2.** Develop and implement law enforcement procedures to protect the refuge's cultural resources and to diminish site destruction due to looting and vandalism.

*Strategies:*

- By 2006, establish and implement a protocol for site damage assessments.
- By 2010, all refuge law enforcement will have taken the Archaeological Resources Protection Act training course.
- By 2010, pertinent refuge staff will have taken the Overview for Cultural Resources Management Requirements course.

**Objective 3.** Facilitate partnerships to aid in the management of cultural resources with the pertinent federal and state agencies, the State Historic Preservation Office, professional archaeologists, Native American communities, and the general public.

*Strategies:*

- Approach the Poarch Band of Creek Indians for information on and input into the management of significant cultural and sacred sites located within the refuge.
- Identify potential venues of archaeological and historic investigations and promote interdisciplinary research.
- Negotiate an agreement with the State of Alabama, Fort Morgan Historic Site, or other appropriate facilities for the permanent curation of archaeological collections and associated documentation derived from archaeological investigations on the refuge (Regional Archaeologist).

**Objective 4:** Develop and implement an educational program that will provide an understanding of, and appreciation for, the refuge's ecology and the human influence on the region's ecosystems.

*Strategies:*

- Work with local Native American and other communities to develop an education program regarding their cultural heritage and history.
- Develop educational displays to convey the historical significance of refuge lands to the public.

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## **Conservation Partnerships**

**Objective 5:** Promote conservation initiatives on the Fort Morgan Peninsula and coastal Alabama.

*Strategies:*

- Through the renewal of the management agreement in 2004 with Fort Morgan State Historic Site, Alabama Department of Historical Resources, ensure the natural character of the area, protect critical habitat for the Alabama beach mouse, and provide important shorebird habitat.
- Continue interagency agreement with Alabama Department of Conservation and Natural Resources to manage 160 acres in the Little Point Clear Unit. The agreement does not expire until 2037.
- Partner with Bureau of Land Management to transfer 28 +/- acres on the Fort Morgan Peninsula to the refuge by 2006, to provide critical habitat for the Alabama beach mouse.
- Continue interagency agreement with Alabama Forestry Commission to provide initial response in wildland fire situations.
- Partner with Alabama Department of Conservation and Natural Resources, Division of State Lands, and Gulf State Park to continue the "Share the Beach" sea turtle volunteer and monitoring program.
- Continue interagency agreement with Fort Morgan Volunteer Fire Department to provide training and support for wildland-urban interface operations and for initial response.
- Continue interagency agreement with Fort Morgan Volunteer Fire Department to provide land for fire station No.1, while encouraging the department to purchase the property from the Service.
- Continue partnership with Alabama Department of Conservation and Natural Resources, Division of State Lands, to assist with coastal clean-up and to provide containers for its marine garbage program.
- Continue partnership with Mobile Bay National Estuary Program to assist twice a year with the derelict crab trap removal program.

**Objective 6:** Develop interagency agreements and partnerships to promote environmental education and conservation.

*Strategies:*

- Work with Baldwin County School District to provide a sea turtle curriculum for elementary students by 2010.
- Work with Weeks Bay National Estuarine Research Reserve to provide integrated environmental education programs to Baldwin County School children which will include native wildlife species and threatened and endangered species by 2010.
- Work with Mobile Bay National Estuary Program to provide environmental education programs on estuaries, watersheds, wetlands, and the refuge's role in water conservation initiatives by 2010.
- Work with the Alabama Cooperative Extension Service to provide conservation programs and informational materials to Baldwin County residents to support conservation initiatives (i.e., native landscaping, dune restoration, and backyard wildlife).
- By 2005, resume participation on Alabama Cooperative Extension Service-Baldwin County Marine and Environmental Education Advisory Board.
- By 2005, resume participation on Mobile and Baldwin Counties' Outreach Task Force.
- By 2005, develop partnerships with state, local, and private organizations to deal with injured and stranded wildlife in a humane manner.
- Develop comprehensive call list of qualified and permitted individuals to treat injured wildlife.

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- Develop a call list of volunteers to pick up and transport wildlife to caretakers.
  - Strengthen partnership with Gulf Coast Convention and Visitors Bureau to continue sea turtle program and to promote compatible, sustainable nature-oriented recreation and experiences for visitors of Alabama's coast.
  - Develop partnership with Gulf Coast Chamber of Commerce to promote sustainable tourism and development along the Alabama Gulf Coast.
  - Become engaged in annexation discussions to ensure that zoning changes by either Baldwin County or the city of Gulf Shores do not negatively impact refuge resources.

**Objective 7:** Develop partnerships with non-governmental organizations to promote conservation on Fort Morgan Peninsula and coastal Alabama.

*Strategies:*

- Work with the Friends of Bon Secour National Wildlife Refuge and the Sea Turtle Adopt-A-Nest program.
- Develop a management agreement with the Alabama Coastal Heritage Trust to manage and acquire (when funds become available) a 40-acre tract in the Little Point Clear Unit.
- Work with Alabama Coastal Heritage Trust and the Sierra Club to identify Alabama beach mouse habitat within the refuge acquisition boundary that may be available for purchase, focusing on large, undeveloped tracts in the Little Point Clear Unit, as well as on inholdings at Vets Village in the Perdue Unit.
- Work with Alabama Coastal Heritage Trust to aid with acquisition of the Luce property within the Perdue Unit.
- Partner with The Nature Conservancy to hold options on tracts within the Perdue and Sand Bayou units until Service funding becomes available.
- In conjunction with The Conservation Fund, work with major landowners such as Navy Cove, Hawkins and Welch, and The Peninsula to purchase these tracts (or develop conservation easements) in the Little Point Clear and Sand Bayou units.
- Partner with Fort Morgan Civic Association to provide semi-annual informational programs concerning conservation initiatives (i.e., semi-annual coastal beach clean-ups on the Fort Morgan Peninsula).
- Work with Little Lagoon Preservation Society to help preserve the west end of the lagoon. Concerns include over-development, increased use of jet skis, a proposed marina, damage to submerged aquatic vegetation, and the refuge's continued ability to provide quality habitat for wildlife and wildlife-oriented experiences for visitors under such pressures.
- Work with Defenders of Fort Morgan to promote conservation initiatives at Fort Morgan State Historic Site.
- Partner with the Hummer Bird Study Group and Friends of Bon Secour National Wildlife Refuge to sponsor a third grade class from a Baldwin County Elementary School each spring and fall to visit the banding demonstration and learn about neotropical migratory birds and conservation of habitat.

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## **Private Lands**

**Objective 8:** Work with private landowners to provide sound biological advice on conservation measures which promote wildlife and native landscapes.

*Strategies:*

- Identify inholdings (private parcels within the refuge boundary) and initiate dialogue concerning acquisition by the refuge, conservation easements, or conservation-friendly techniques to employ when developing coastal properties.
- Inform and educate coastal landowners about native landscaping, dune restoration, and other conservation measures.

## **Land Acquisition**

**Objective 9:** Continue land acquisition program to purchase inholdings within the approved acquisition boundary of the refuge from willing sellers at the appraised market value.

*Strategies:*

- By 2005, identify all inholders, update address and contact lists, and inquire as to their willingness to sell their properties to the refuge.
- Continue land acquisition planning efforts to receive project funding.
- Work with partner organizations such as the Alabama Coastal Heritage Trust, The Nature Conservancy, The Conservation Fund, and others in order to acquire land.
- Develop non-traditional land protection programs, such as management agreements, lease agreements, and conservation easements. Target large undeveloped tracts such as Navy Cove, Pilot Town, Hawkins and Welch, Oetgen, The Peninsula, City of Gulf Shores Utility Board, Meyer Foundation and Meyer Holdings, Wilters, and the south side of 180 in the Perdue Unit.

## **Law Enforcement**

**Objective 10:** Develop a comprehensive law enforcement program for the refuge.

*Strategies:*

- Employ a full-time law enforcement officer to protect refuge resources, facilities, and visitors.
- By 2010, implement a Law Enforcement Plan for the refuge.
- Strengthen law enforcement relationships with the city of Gulf Shores, Baldwin County, and the State of Alabama Alcoholic Beverage Commission.

## ***GOAL 4: PUBLIC USE AND ENVIRONMENTAL EDUCATION***

Provide the public with quality environmental education and interpretation programs; outreach opportunities; and recreational activities that lead to enjoyment and a greater understanding of, and appreciation for, fish, wildlife, habitats, and cultural resources of coastal Alabama.

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**Objective 1:** Interpret refuge resources to lead to enjoyment and a greater understanding of, and appreciation for, natural and cultural resources found on and off the refuge.

*Strategies:*

- Interpret wetlands and develop trail guide for Three Rivers Kayak Trail, once trail is completed.
- Replace interpretive signs at Gator Lake/Pine Beach Trail, as needed.
- Improve interpretive signs along the Jeff Friend and Pine Beach trails, as needed.
- Design interpretive displays for a visitor center and education classrooms should such a facility be constructed.
- Complete native plants demonstration area if a new office is constructed.
- Replace interpretive panels at Mobile Street dune walkover, as needed.
- Work with the Bureau of Land Management's Jackson Field Office to design dune walkover to face easterly at the terminus.

**Objective 2:** Create new and enhance existing outreach opportunities that lead to enjoyment and a greater understanding of, and appreciation for, fish, wildlife, habitats, and cultural resources of coastal Alabama.

*Strategies:*

- Continue participation in sustainable tourism program sponsored by the Gulf Coast Chamber of Commerce and the Convention and Visitors Bureau.
- Present annual program to city, county, and state government officials to update them on refuge programs and plan implementation.
- Continue civic association programs and train all staff to give programs.
- Work with local tourism agencies to promote wildlife-dependent recreation by providing general tear sheets and turtle fact sheets to the Convention and Visitors Bureau, visitor centers, Gulf Shores Museum, and Fort Morgan Museum.
- Continue working with real estate companies, rental agencies, and management regimes to promote sea turtle friendly lighting and educational programs by holding annual meetings and providing educational materials such as stickers, tear sheets, magnets, and door hangers.

**Objective 3:** Conduct environmental education programs that lead to enjoyment and a greater understanding of, and appreciation for, fish, wildlife, habitats, and cultural resources of coastal Alabama.

*Strategies:*

- Working with the Baldwin County School System, develop a sea turtle curriculum for elementary schools by 2010.
- Assist with planning and apply for grants to fund displays for the Orange Beach Elementary School Marine Science Center.
- By 2010, involve Gulf Shores/Orange Beach High School seniors interested in a career in marine science, biology, or natural resources in a sea turtle monitoring program.
- Develop a classroom in the visitor center, if one is constructed, to host school groups.
- Develop educational panels concerning native wildlife and habitats for display at Orange Beach Elementary School Marine Science Center; Gulf Shores Visitors Center; Orange Beach Visitors Center; Gulf Shores Museum; and Fort Morgan Museum.
- Partner with the Friends of Bon Secour National Wildlife Refuge and Hummer Bird Study Group to sponsor a third grade class each spring and fall to visit the banding demonstration.

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## **Wildlife-dependent Recreation**

Provide compatible wildlife-dependent recreational opportunities that lead to enjoyment and a greater understanding of, and appreciation for, fish, wildlife, habitats, and cultural resources of coastal Alabama.

**Objective 4:** Adequately staff refuge to optimize visitor services and wildlife-oriented recreation.

*Strategies:*

- Employ a full-time law enforcement officer to protect refuge facilities, resources, and visitors.
- Employ an outdoor recreation planner to fully implement interpretive, environmental education, outreach and recreation programs to support 100,000 visitors annually.
- By 2010, write and implement a Visitor Services Plan.
- Employ a seasonal maintenance worker to assist with facilities maintenance and upkeep.
- Work with Baldwin County officials in attempting to resolve parking problems along Mobile Street.

**Objective 5:** By 2010, create recreational opportunities in the Sand Bayou Unit (Figure 19).

*Strategies:*

- Work with city and county officials to improve road access.
- Improve existing trail system through the use of signage.

**Objective 6:** Optimize recreational opportunities in the Perdue Unit, while still protecting critical habitat for a suite of threatened and endangered species (Figure 20).

*Strategies:*

- Working with the Friends of Bon Secour National Wildlife Refuge, provide canoe/kayak strollers at the Jeff Friend and Pine Beach trailheads for visitors who wish to canoe, kayak, or fish in Little Lagoon or Gator Lake. By 2006, utilize self pay station (honor system) with combination lock.
- Construct a maintenance shop in the main compound to enhance support of all refuge programs and visitor services, in particular.
- Replace dilapidated kiosk at Gator Lake/Pine Beach trail with a composting restroom facility.
- Build visitor center on Baggett property once it is acquired by the Service, to include visitor displays and education center.
- Remodel current office when the need arises.
- Construct dune walkover boardwalk at Veterans Road with regulatory signage when the parcel has been transferred by the Bureau of Land Management to the Service.
- Construct accessible fishing pier at Gator Lake.

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**Objective 7:** Create recreational opportunities in the Little Point Clear Unit (Figure 21).

*Strategies:*

- Develop kayak trail in Three Rivers Bay or St. Andrews Bay on the Little Point Clear Unit with a launch site at The Pines public launch. Pursue a launch site on the west side of the Little Point Clear unit.
- Construct dune walkover at Bureau of Land Management Tracts 3 and 4 with regulatory signage when the parcels have been transferred to the Service.

**Objective 8:** Work with the Fort Morgan State Historic Site to provide wildlife-dependent recreational opportunities in the Fort Morgan Unit that are compatible with the critical habitat designation of the unit (Figure 22).

*Strategies:*

- By 2010, develop a permitting system and user fee to allow for night fishing on Mobile Point during October and November. This strategy will not be implemented until staffs (law enforcement and public use) are employed to implement, monitor, and regulate this use.
- By 2010, work with Fort Morgan management to provide beach access and parking.

**Objective 9:** Study the feasibility of implementing user fees for certain activities that have higher impact on refuge resources to help pay for enforcement, facilities, and maintenance.

*Strategies:*

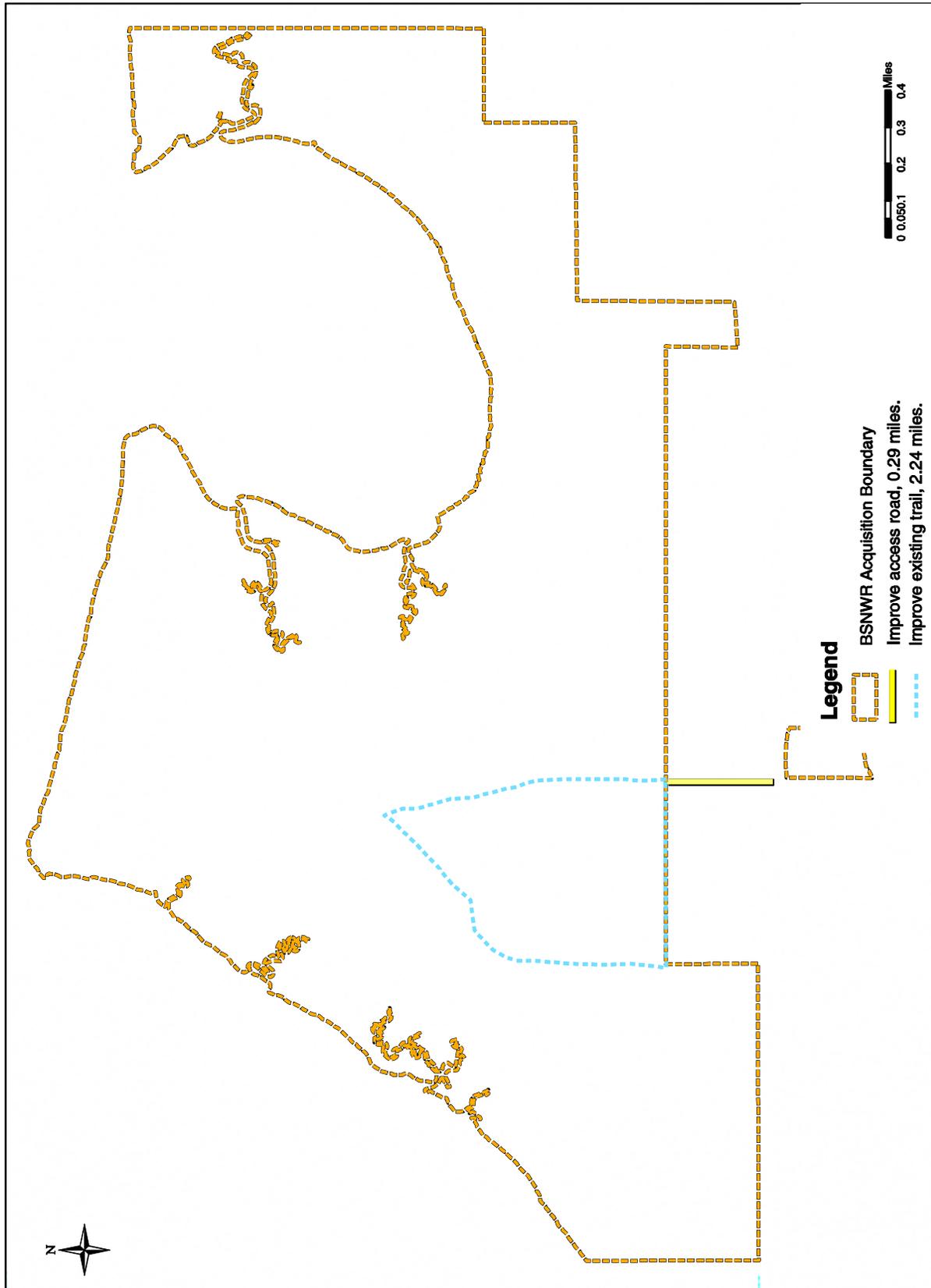
- By 2010, develop a monitoring program to study the impacts of visitors on critical habitats and to determine appropriate limits to ensure that recreation is compatible with endangered species management.
- By 2010, establish a permitting system and user fee for night fishing at Mobile Point during October and November.  
Develop a concessions policy based on the Service's existing policy to provide information for those interested in leading tours on the refuge. Have policy in place by 2009.

**Objective 10:** Develop systematic ways to deal with increasing litter on the refuge and large debris deposited on beaches following storms/hurricanes.

*Strategies:*

- Participate in the annual coastal clean-up each September.
- Schedule beach sweeps (litter removal) each spring and fall.
- Provide refuge waste receptacles at each trailhead parking lot and all beach accesses. Empty trash each Monday and Friday.
- Develop a strategy to remove trash from refuge beaches and from the north side of the lagoon after hurricanes/storm events.

Figure 19. Proposed recreational facilities for the Sand Bayou Unit, Bon Secour National Wildlife Refuge



**Figure 20. Proposed recreational facilities for the Perdue Unit, Bon Secour National Wildlife Refuge**

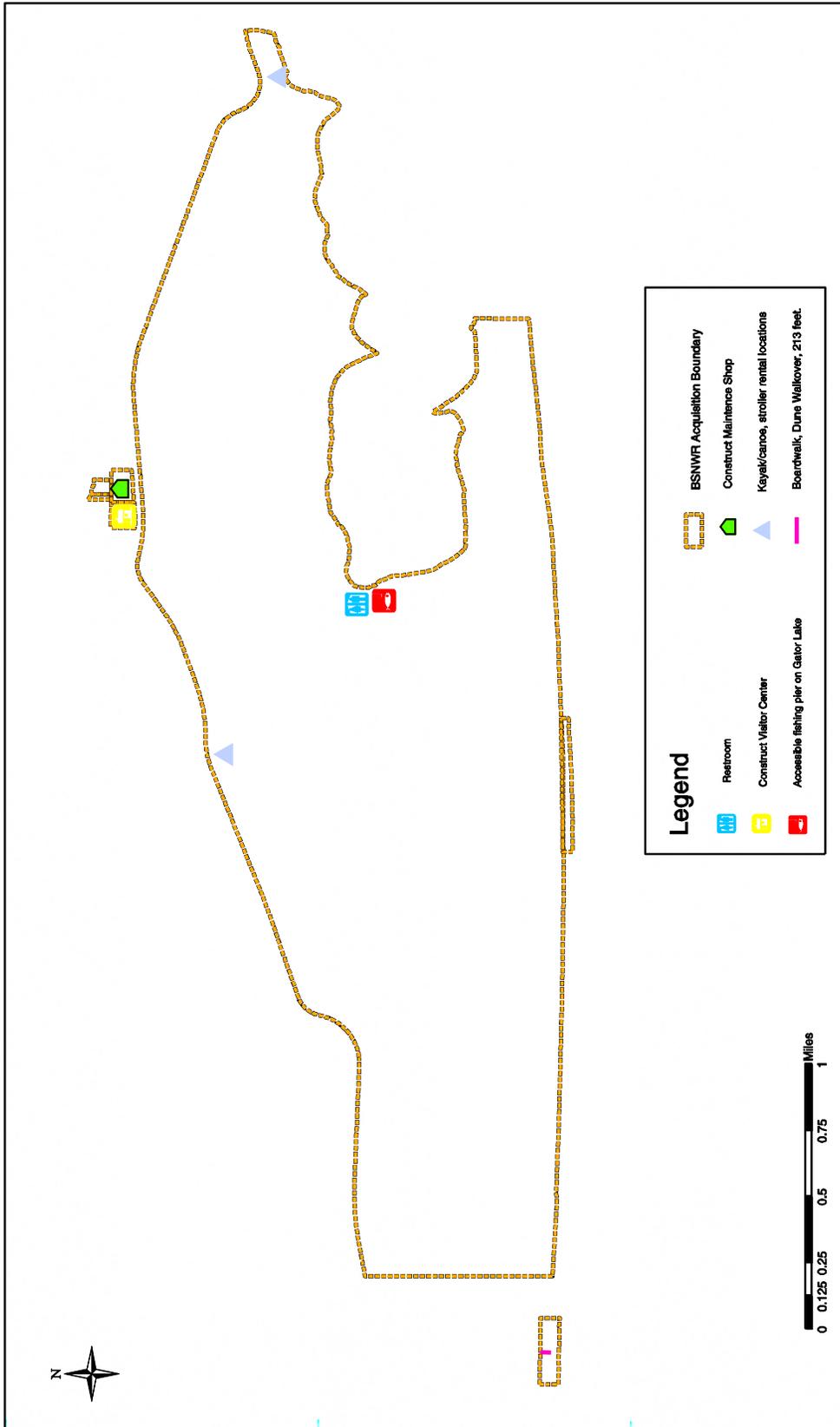


Figure 21. Proposed recreational facilities for the Little Point Clear Unit, Bon Secour National Wildlife Refuge

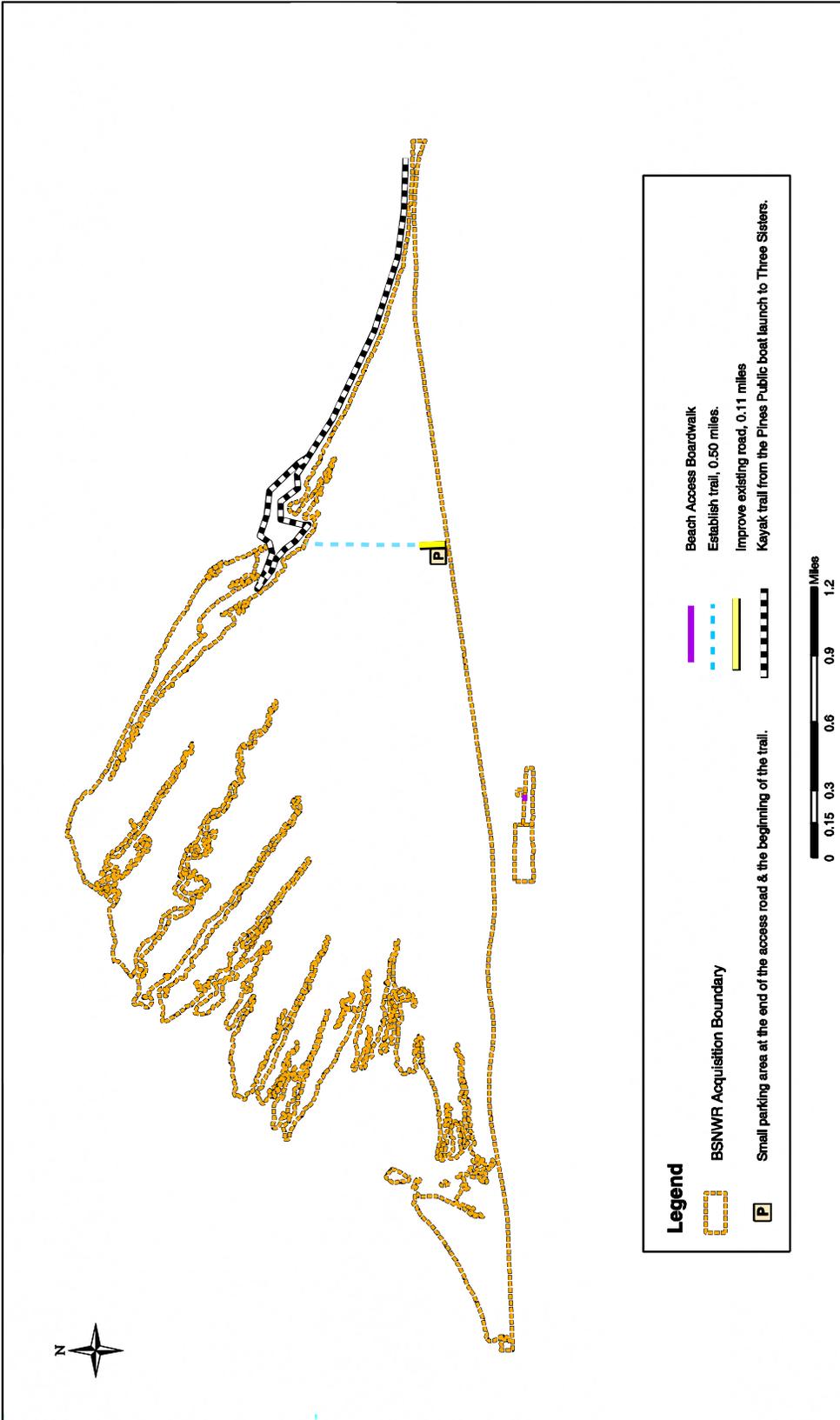
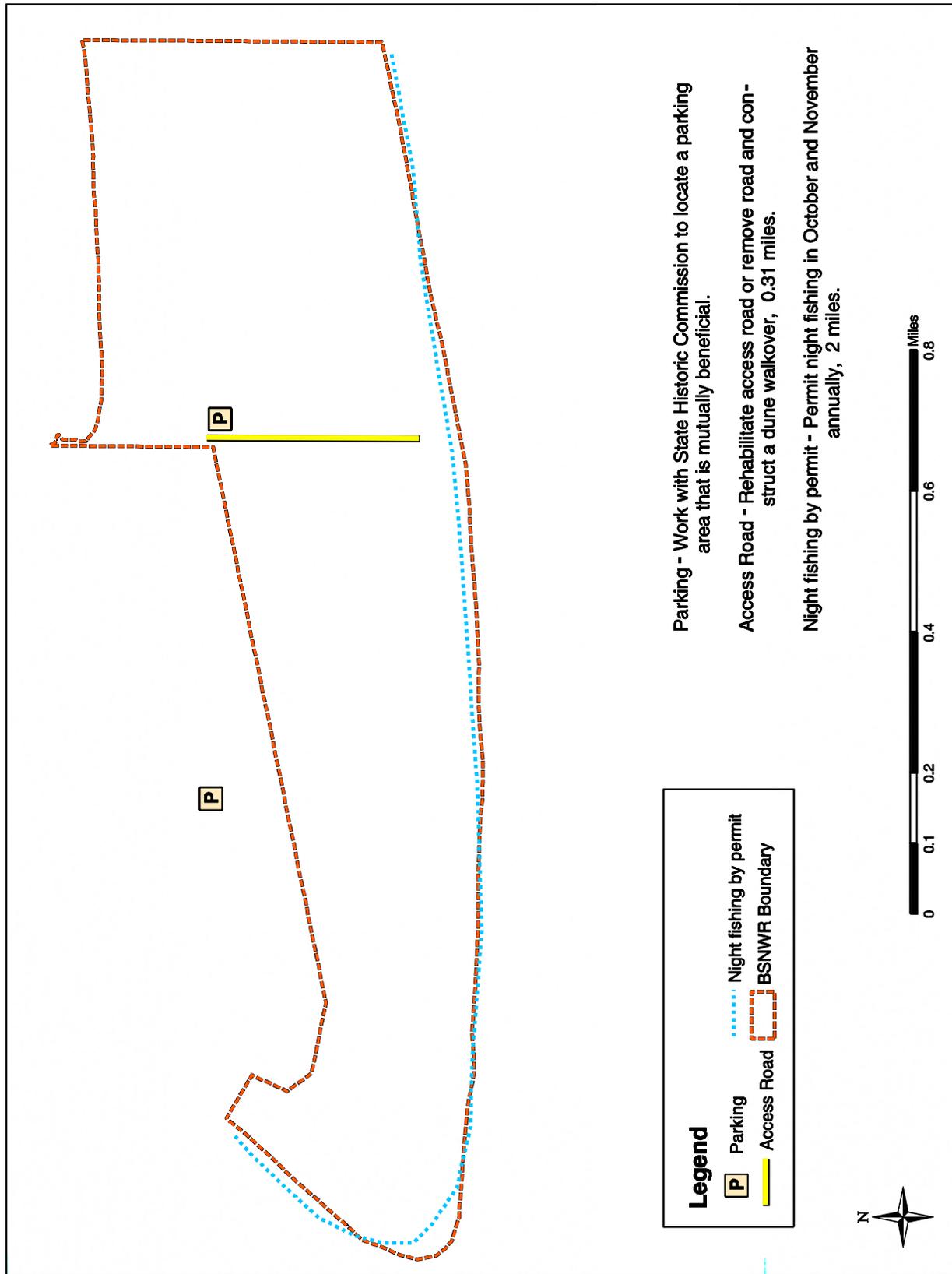


Figure 22. Proposed recreation facilities for the Fort Morgan Unit, Bon Secour National Wildlife Refuge



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# V. Plan Implementation

## INTRODUCTION

Refuge lands are managed as directed under the National Wildlife Refuge System Improvement Act of 1997, the Fish and Wildlife Service Manual, sound biological principles, and current research. Congress has defined a clear legislative mission of wildlife conservation for all national wildlife refuges, which unlike other public lands, are dedicated to the conservation of the nation's fish and wildlife resources. Recreational uses are accommodated where appropriate and compatible, while still meeting the congressional charge of wildlife first. Priority projects emphasize the protection and enhancement of fish and wildlife species first and foremost, while consideration is given to addressing the needs and demands for recreation and environmental education.

## PROPOSED PROJECTS AND PERSONNEL

The proposed projects reflect the basic needs identified by Service staff, the public, and the planning team members for the management of fish and wildlife populations, habitats, cultural resources, land protection, public use, outreach, and environmental education. Among these projects is a list of step-down management plans to be developed. Step-down plans are individual and specific and are the blueprint under which refuges operate. Some existing plans need revision, while others need to be developed. The Service prepares step-down plans in conjunction with the provisions set forth in the National Environmental Policy Act of 1969.

Annual funding for staff, facilities, operations, and maintenance is an integral part of project implementation. General cost estimates are provided in Table 7. These figures will be updated and adjusted annually. Essential needs are addressed, such as eliminating significant biological threats and problems, meeting National Wildlife Refuge System mission requirements, and fulfilling the purposes for which the refuge was established. Land acquisition, within the approved refuge boundary, is considered to be the highest priority and an ongoing project. Land values are subject to time of sale and market value variables and therefore, estimates given are approximate and represent only the minimum needed to proceed. There are no assurances that these projects will be either partially or fully funded. However, with the help and cooperation of conservation partners, the Service will use this plan to focus attention on funding the operations and maintenance needs of the refuge.

For the purpose of achieving the goals and objectives developed for the refuge, the plan has grouped management strategies into specific projects. The plan describes 23 projects for development and management. Additional staff will be needed to implement these projects. Partnership agreements that will facilitate project implementation are also discussed.

The reader will note that a Refuge Operating Needs System (RONS) and/or a Maintenance Management System (MMS) number has been assigned to each project. The RONS is a national database, which contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates. The MMS, also a national database, is a management tool for planning and budgeting maintenance, capital improvements, and equipment replacement projects. The objectives linked to specific projects are also listed.

**Project 1.** Standardize surveys and monitoring of Alabama beach mouse; transient, nesting, and wintering songbirds, shorebirds, and marshbirds; and herpetofauna.

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Systematic surveys based on standardized protocols would be conducted to determine presence and distribution of priority wildlife species and to provide baseline data to assist managers in habitat management practices. A full-time wildlife technician would be employed to assist in implementing the monitoring program. Information to be collected is the foundation for implementing the Comprehensive Conservation Plan, formulating habitat management, and developing adaptive management strategies for species of conservation concern.

**RONs 96007; Wildlife Objectives 1, 7, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20**

**Project 2.** Promote sea turtle conservation along the Alabama coast.

Bon Secour Refuge provides nesting habitat for three species of sea turtles—the endangered green and Kemp's ridley, and the threatened loggerhead. Nesting occurs along the entire Alabama coast. For the past 3 years, the Service and the State of Alabama have worked cooperatively to monitor sea turtle nesting from Ft. Morgan to the Florida state line, a distance of 40 miles. To cover this distance, hundreds of volunteer turtle watchers from the community would be recruited and trained. Student Conservation Association interns would be employed to organize and lead the volunteers. Equipment and materials necessary to mark the nests would be purchased. Educational materials would be provided to residents of area beaches to encourage them to "turn their lights out for turtles."

**RONs 02001; Wildlife Objectives 3, 4, 5, 6**

**Project 3.** Build and maintain databases containing biological resource data and spatial relationships for the refuge and surrounding coastal environments.

A geographic information system is not in use at Bon Secour Refuge. Few data have been collected and those that exist are stored in a menagerie of point files with no geographic reference. This project would develop an up-to-date data management, storage, and retrieval system; obtain spatial information from appropriate sources; develop geographic layers for refuge management programs; and facilitate spatial analysis and creation of maps by the refuge's biological staff.

**RONs 04001; Wildlife Objectives 19, 20; Habitat Objectives 7, 8, 9, 14**

**Project 4.** Evaluate scrub habitat for the Alabama beach mouse.

Bon Secour Refuge provides critical habitat for the endangered Alabama beach mouse. As coastal habitats that surround the refuge continue to be developed, the refuge is expected to play an integral role in the recovery of this species. Researchers have documented that densities of beach mice decrease as vegetative cover increases. This study would manipulate shrub habitat by decreasing the overall density of vegetation to determine if this type of habitat would be utilized by the beach mouse. Based on the findings of this multi-year research project, refuge habitat would then be managed to provide optimum habitat conditions for this endangered species. The research would be conducted by technicians and graduate students from universities.

**RONs 02002; Habitat Objectives 1, 2**

**Project 5.** Use prescribed fire to promote and maintain shrubs for transient songbird population.

A proactive prescribed burning program is essential to maintain diverse wildlife habitats and to reduce fuel loads that could lead to devastating wildfires. In order to properly manage a wide array of species, including protected species such as the gopher tortoise, it is critical that refuge lands be evaluated for prescribed fire application on a regular schedule and under controlled conditions. Bon Secour Refuge hosts more than 370 species of birds throughout the year. Because the area has not been burned in many years, fuel loads have built up and understories are extremely thick. The threat of a wildfire is very real and could cause significant damage to the existing habitat and adjacent

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human structures if one were to occur. Furthermore, habitats for transient songbirds have been degraded. Restoring these habitats, through the use of controlled burns, reduces the potential of wildfire, while enhancing habitat for priority migratory birds. Prescribed burning is also an effective tool to minimize the spread of invasive exotic plant species.

**RONS 01003; Habitat Objectives 3, 4, 5**

**Project 6.** Evaluate the ecological role of prescribed fire in coastal ecosystems.

Bon Secour Refuge contains nearly 7,000 acres of dunes, sand scrub, mixed pine hardwoods, pine flatwoods, and marsh. Historically, periodic fire burned throughout these ecosystems. The exclusion of fire, due to human development and encroachment, has led to changes in habitat structure and species composition. This project would establish study plots in fire-maintained habitats. A range of fire regimes would be applied in an effort to determine seasonality and intensity of fire needed to accomplish management objectives to restore habitat. Pre-burn and post-burn vegetation sampling would occur. This would be a cooperative research project between the refuge biological staff, the fire crew of Mississippi Sandhill Crane National Wildlife Refuge, and the regional fire ecologist.

**RONS 02003; Habitat Objective 7**

**Project 7.** Determine the distribution of birds in fire manipulated habitats.

This project would establish point count plots in both fire-excluded and fire-manipulated habitats to determine species suites and the role periodic fire might play in the distribution of birds on the refuge.

This would be a cooperative research project between the refuge biological staff, the fire crew of the Mississippi Sandhill Crane Refuge, and the University of Southern Mississippi.

**RONS 02004; Wildlife Objectives 8, 9; Habitat Objectives 3, 4, 5**

**Project 8.** Eradicate invasive Chinese tallow trees and cogongrass.

Bon Secour Refuge remains the last example of undeveloped dune habitat along the Alabama coast in Baldwin County. With encroaching development, invasive species, such as Chinese tallow trees and cogongrass, are expanding onto refuge lands. Current known locations are along refuge roads and trails. Without control, these species would spread into the refuge interiors, degrading habitat for the Alabama beach mouse, 370 species of birds, and a variety of herpetofauna. This project would identify invasive species, determine their distribution, and treat affected areas using appropriate control measures.

**RONS 01001; Habitat Objectives 10, 11**

**Project 9.** Protect refuge resources and visitors.

Bon Secour Refuge hosts more than 100,000 visitors annually. In recent years, vandalism, encroachment activities, loitering, and obscenity crimes have increased due to the remoteness of the refuge and the lack of regular law enforcement patrols. The use of the refuge is limited to daylight hours and trespass, along with other illegal activities, such as camping, having camp fires, and driving on the beach, has resulted in disturbance to nesting sea turtles and beach mice, which are nocturnal.

The presence of a full-time law enforcement officer would result in improved visitor safety and services. Regular law enforcement patrols would deter vandalism, trespass, loitering, and other activities that disturb wildlife, and address law enforcement situations when they occur.

**RONS 96005; Wildlife Objective 11; Habitat Objective 6; Resource Conservation Objectives 2, 10; and Public Use and Recreation Objective 4**

**Project 10.** Delineate rare plant communities.

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Bon Secour Refuge is one of the last remaining, undisturbed coastal ecosystems along the Gulf Coast. This project would inventory and delineate rare plants on the refuge. The identification of ecological communities, an important basic conservation tool, has not been completed. This project would identify and classify plant communities using The Nature Conservancy protocol, identify rare populations, and provide maps and electronic layers of data for use with the refuge's GIS program. This would provide the refuge with the information needed to conserve plant biodiversity, manage plant communities utilizing appropriate tools (e.g., prescribed fire), and manage wildlife associated with specific plant communities.

**RONs 01006; Habitat Objective 7**

**Project 11.** Manage forest structure to optimize migratory bird and gopher tortoise habitats on the refuge.

Since the refuge was established in 1980, the staff has focused attention on dune and swale habitats along the immediate coast. As a result, interior habitats that once supported a variety of migratory bird species and a population of gopher tortoises have become degraded due to increased basal area and exclusion of periodic fire. This project would contract the writing of a Forest Management Plan that would provide silvicultural prescriptions to manage refuge forested communities for trust species.

**RONs 04002; Habitat Objective 8**

**Project 12.** Protect archaeological resources through survey and planning.

Bon Secour Refuge has an incredible archaeological history, however, only a few sites have been documented. This project would provide for the completion of an archaeological survey and the development of a protection plan for cultural and historical resources identified by the survey.

**RONs 97001; Resource Conservation Objectives 1, 2, 3, 4**

**Project 13.** Provide outreach and enhance visitor services.

Bon Secour Refuge hosts more than 100,000 visitors annually. This project would enable the refuge to employ an outreach and visitor services specialist to reach additional residents, tourists, and school children to explain the refuge's role in the coastal ecosystem, as well as ecological threats to the refuge and its resources. This position would improve partnership opportunities and expand educational programs by working with untapped sources, such as Weeks Bay National Estuary Research Reserve, Mobile Bay National Estuary Program, and other organizations. Refuge resources would be appropriately interpreted and communication with outside audiences via news releases, web media, and special events would be coordinated.

**RONs 00006; Public Use and Recreation Objectives 1, 2, 3, 4, 6**

**Project 14.** Improve maintenance operations and facilities management.

This project would provide a seasonal maintenance worker to improve refuge operations and facilities maintenance, including trails, parking lots, kiosks, signs, and boardwalks. The seasonal worker would assist with maintenance of refuge buildings and quarters, as well as in the construction and maintenance of sand fencing and fire breaks. Also, this project would enable the construction of a much-needed maintenance facility. Currently, the refuge staff operates out of a 4-bay pole shed and a series of storage buildings located in three separate areas. A consolidated maintenance facility would significantly improve operations.

**RONs 00007; MMS 00006; Public Use and Recreation Objectives 4, 5, 6, 7, 8, 9, 10**

**Project 15.** Create wildlife-dependent recreational opportunities in the Sand Bayou Unit.

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The Sand Bayou Unit of the refuge is the closest unit to the city of Gulf Shores. The unit is surrounded by residential development on three sides and Bon Secour Bay on the remaining side; however, there is no public access. This project would improve access and trails so that refuge visitors could experience the unique pine/hardwood habitats of this unit.

**MMS 04001; Public Use and Recreation Objective 5**

**Project 16.** Enhance wildlife-dependent recreational opportunities on the Jeff Friend Trail.

The Jeff Friend Trail is a 1-mile loop trail that provides spectacular views of the Little Lagoon and traverses wetland and upland communities with excellent birding opportunities. This project would enhance interpretation, provide access for canoes and kayaks to the Little Lagoon, and improve surfacing of the trail to accommodate mobility impaired visitors.

**MMS 02006; Public Use and Recreation Objectives 1, 6**

**Project 17.** Enhance wildlife-dependent recreational opportunities on the Pine Beach Trail.

The Pine Beach Trail is the most popular of the refuge trails and serves as a hub for visitors. Currently, interpretive facilities include a deteriorating kiosk with outdated signs. This project would replace the existing kiosk with a self-composting restroom, construct a kiosk facility, and update interpretive signage.

**MMS 02002; Public Use and Recreation Objectives 1, 6**

**Project 18.** Orient and educate visitors.

Bon Secour Refuge hosts more than 100,000 visitors annually. Currently, there is a 200-square-foot area in the refuge office that is used to greet and orient visitors. This project would enable the construction of a new visitor center and refuge office building to adequately meet visitor service needs and help accommodate increasing staff.

**RONs 04004 (or MMS 04002); Public Use and Recreation Objectives 1, 2, 3, 6**

**Project 19.** Provide environmental education opportunities and serve as a training ground for conservation interns.

The current refuge office was constructed in 1993 and provides office space for three employees. Once a new office is constructed, the current office would be remodeled to accommodate biological staff and interns and to provide a classroom/conference room facility for visiting school groups and organizations.

**MMS 97002; Public Use and Recreation Objectives 3, 4**

**Project 20.** Protect dune structure and habitat for the Alabama beach mouse by providing elevated boardwalks for beach access points.

Sand dunes, by nature, are very fragile and are mainly sustained by root systems of vegetation that stabilize the shifting sand. If people walk on the dunes, the root systems are destroyed and are no longer able to hold the sand in place. Areas where vegetation has been removed become channels for storm surge during both winter and summer storm events. This leads to erosion and destruction of habitat. This project would enable the construction of dune walkovers at beach access points to protect this fragile habitat.

**RONs 04005; Public Use and Recreation Objectives 6, 7**

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**Project 21.** Enhance fishing opportunities at Gator Lake.

Gator Lake is a 40-acre freshwater lake in the Perdue Unit that is only accessible for bank fishing. Since the banks are covered in vegetation and alligators frequent the lake, fishing opportunities are limited to the brave and determined. This project would enable the construction of a fishing pier to improve angler possibilities and also to provide wildlife observation and photography opportunities.

**MMS 02007; Public Use and Recreation Objective 6**

**Project 22.** Provide wildlife-dependent recreational opportunities in the Little Point Clear Unit.

The Little Point Clear Unit is currently inaccessible. The unit is characterized by ridge and swale habitat, as well as unique wetland habitats. This project would enable the development of a kayak trail, improve access, and provide parking.

**RONs 04006; Public Use and Recreation Objectives 7**

**Project 23.** Acquire lands to fulfill the acquisition boundary of Bon Secour Refuge.

To date, 6,978 acres have been acquired in the 12,570-acre approved acquisition boundary. This project is fully discussed in Chapter II. The refuge prioritizes acquisitions into three categories and summarizes funding needed to fulfill the purposes for which the refuge was established, as well as to fully implement this Comprehensive Conservation Plan.

**Resource Conservation Objective 9**

## **FUNDING AND PERSONNEL**

Implementation of this plan will require increased funding and personnel support that will come from a variety of internal and external sources. New projects are identified in RONS, while maintenance needs for existing facilities and projects are identified through MMS. This plan outlines proposed projects that are not substantially above current budget allocations. The plan does not constitute a commitment (from Congress) for staffing increases, operational and maintenance increases, or funding for future land acquisition, but represents wildlife resource needs based on sound biological science and input from the public.

According to predictions based on the RONS database, the refuge staff will need to increase from a total of 5 in Fiscal Year 2004, to a total of 8.75 by 2011 (Table 8 and Figure 23). This increase in staff will also necessitate an increase in base funding above standard yearly increases that allow only for inflation.

**Table 7. Proposed projects and personnel costs for Bon Secour National Wildlife Refuge.**

<b>Project Title</b>	<b>Initial Cost*</b>	<b>Annual Cost**</b>	<b>First Year Cost***</b>
<b>Surveys &amp; Monitoring</b>	80,000	59,000	139,000
<b>Sea Turtle Conservation</b>	51,000	10,000	61,000
<b>Database/GIS Establishment</b>	20,000	2,000	22,000
<b>ABM Habitat</b>	127,000	30,000	157,000
<b>Prescribed Fire - Songbirds</b>	54,000	--	54,000
<b>Prescribed Fire - Coastal Systems</b>	77,000	--	77,000
<b>Prescribed Fire - Bird Distribution</b>	75,000	--	75,000
<b>Invasive Species Eradication</b>	55,000	5,000	60,000
<b>Refuge LE Officer</b>	100,000	59,000	159,000
<b>Rare Plant Communities</b>	22,000	--	22,000
<b>Forest Structure</b>	50,000	--	50,000
<b>Archeological Resources</b>	60,000	--	60,000
<b>Outreach Specialist</b>	70,000	59,000	129,000
<b>Maintenance Operations</b>	380,000	57,000	437,000
<b>Sand Bayou Recreational Opportunities</b>	50,000	5,000	55,000
<b>Jeff Friend Trail Enhancements</b>	46,000	2,000	48,000
<b>Pine Beach Trail Facility</b>	34,000	5,000	39,000
<b>Visitor Center</b>	464,000	36,000	500,000
<b>Environmental Education</b>	125,000	36,000	161,000
<b>Beach Boardwalks</b>	300,000	5,000	305,000
<b>Fishing Pier at Gator Lake</b>	40,000	1,000	41,000
<b>Kayak Trail Little Point Clear</b>	55,000	5,000	60,000
<b>Project Total</b>	<b>2,335,000</b>	<b>376,000</b>	<b>2,711,000</b>
<b>Complete Refuge Acquisition</b>	<b>11,730,000</b>	<b>10,000</b>	<b>11,740,000</b>
<b>Total Including Land Acquisition</b>	<b>14,065,000</b>	<b>386,000</b>	<b>14,451,000</b>

\* Construction and start-up costs;

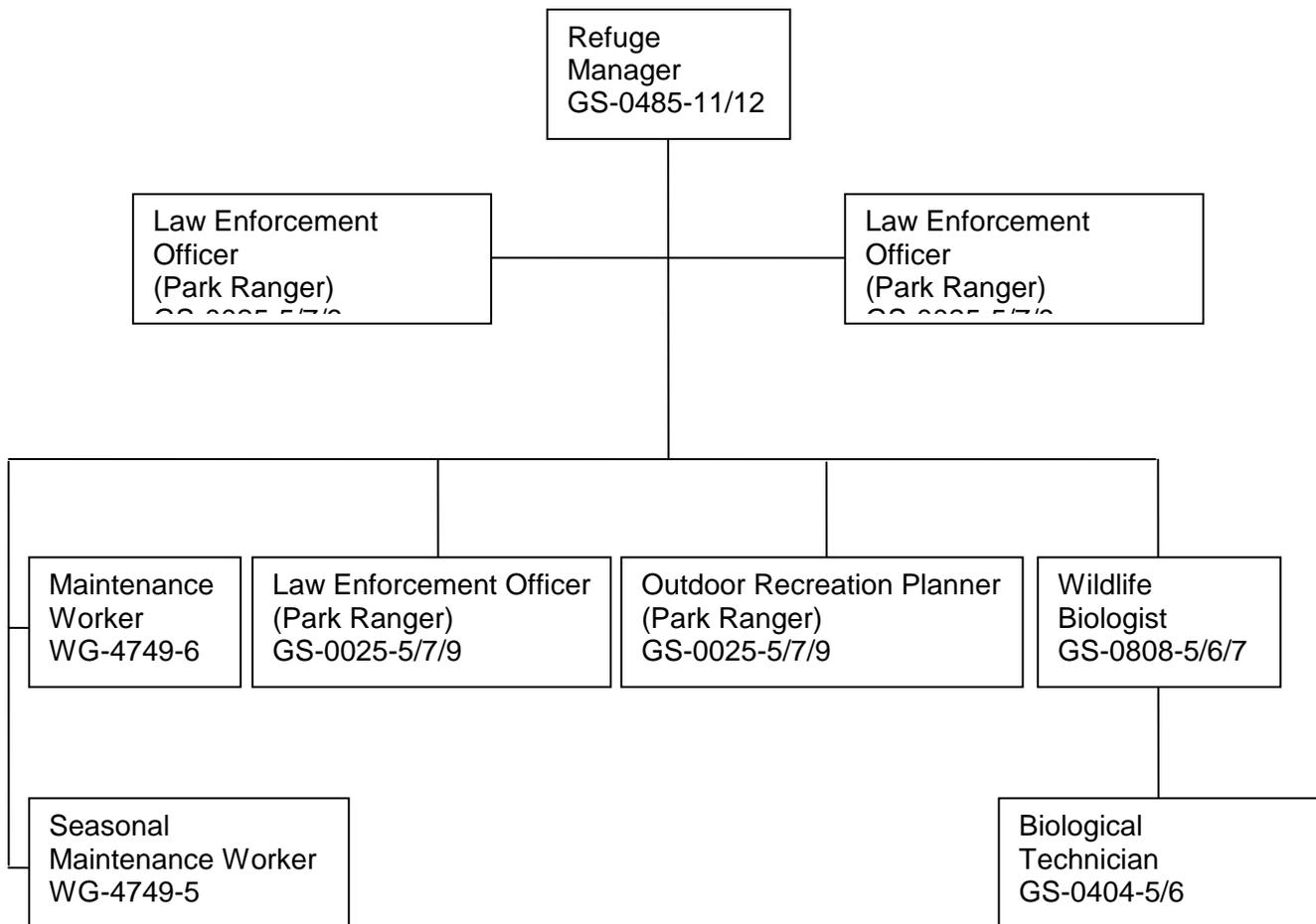
\*\* Salary/benefits, utilities, Service contracts, supplies, facility leases, training, travel, and maintenance;

\*\*\* Combination of initial and annual costs.

**Table 8. New personnel needed to fulfill the purposes of the refuge and to implement the Final Comprehensive Conservation Plan.**

Position	Objective Number	RONS Project No.	FTEs
Law Enforcement Officer	Resource Conservation 7	96005	1
Outdoor Recreation Planner	Public Use and Recreation 4	00006	1
Seasonal Maintenance Worker	Public Use and Recreation 4	00007	.75
Biological Technician	Wildlife 1, 7, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20	96007	1

**Figure 23. Proposed organizational chart for Bon Secour National Wildlife Refuge**



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## **VOLUNTEERS**

Private citizens contributing volunteer services are involved in every aspect of refuge management. These volunteers fortify the refuge staff with skills and energy. By becoming knowledgeable about the refuge and its wildlife, they become advocates in and beyond the local community. There is a long history of volunteers working on the refuge to accomplish tasks that otherwise would remain undone. The volunteer program is constantly growing and is expected to grow even faster in the future as more seasonal residents discover the mild Alabama winters. The addition of an outdoor recreation planner will enhance volunteer opportunities on the refuge.

## **PARTNERSHIP OPPORTUNITIES**

Public outreach entails a variety of services and support that refuges provide to the public, special groups, other governmental agencies, and individuals. It includes technical assistance to state agencies and presentations to local civic groups and schools.

Many biologists and private citizens, as well as environmental organizations and agencies, have expressed a great interest in becoming involved with the management of the refuge. Developing and maintaining partnerships will enable the refuge to achieve its goals and objectives, minimize costs, share funding, and bridge relationships. In order to maintain and enhance wildlife outside refuge boundaries, the Service will focus its efforts on continuing to develop partnerships with the Alabama Department of Conservation and Natural Resources (Wildlife Resources, State Lands, Coastal Programs, and Gulf State Park); Fort Morgan State Historic Site; Bureau of Land Management; Mobile Bay National Estuary Program; Weeks Bay National Estuarine Research Reserve, Alabama Gulf Coast Convention and Visitors Bureau; Chamber of Commerce; and the Friends of Bon Secour National Wildlife Refuge. Although the Service does not have management responsibilities outside refuge boundaries, it is important to articulate the wildlife resource needs throughout coastal Alabama. Collaboration with colleges and universities, as well as with conservation organizations, will enable the refuge to carry out extensive plans for research, monitoring, and education. To create an awareness of, and appreciation for, refuge and coastal resources, an expanded environmental education program will be implemented with community and school partnerships.

## **STEP-DOWN MANAGEMENT PLANS**

Refuge policy (Refuge Manual, Part 4, Chapter 3) requires that specific refuge management plans be developed for each refuge. Some plans require annual revisions, while others are on a 5- to 10-year schedule for revision. Refuge staff will continue to seek public and professional input in the development, revision, and implementation of step-down management plans. While some plans are in place, others have yet to be developed. Existing step-down plans that need some level of modification or updating to implement the direction of this comprehensive conservation plan, or those that require periodic review and revision under this plan, are listed in Table 9. Presently, Bon Secour Refuge has two step-down plans: Hurricane Safety Plan and Fire Management Plan.

## **MONITORING AND ADAPTIVE MANAGEMENT**

Refuge management is dependent on monitoring and evaluation to sustain the function and dynamics of wildlife habitats, to maintain biological diversity, to protect target species, and to provide a variety of quality wildlife-dependent recreational and educational experiences to visitors. Both wildlife population (i.e., involving primarily beach mice, sea turtles, and birds) and habitat monitoring will be emphasized. Wildlife monitoring will include avian surveys during the breeding, wintering, and migratory seasons, as well as species richness measurements and relative abundance figures.

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Habitat monitoring will primarily involve surveys and analysis of vegetation, forest structure and composition, and habitat parameters addressed through plan strategies.

Information derived from monitoring and evaluation will enable managers to test and adjust management objectives outlined in this plan. Adaptive management is a flexible approach to long-term management of biotic resources, which is directed over time by the results of ongoing monitoring activities and other information. Adaptive management is a process by which projects are implemented within a framework of scientifically driven experiments to test predictions and assumptions, as outlined in this plan. The biological programs are systematically evaluated to determine management effects on wildlife populations. This information is used to refine approaches and to determine how effectively goals and objectives are being accomplished. Evaluations will be conducted on a regular basis to provide feedback to stakeholders and partners. If monitoring and evaluation yield undesirable effects on target and non-target species and/or communities, management projects will be altered and this plan will be revised.

**Table 9. Proposed step-down management plans for Bon Secour National Wildlife Refuge.**

<b>Plan</b>	<b>Anticipated Completion Date (Fiscal Year)</b>
Habitat Management Plan	2005
Integrated Pest Management Plan	2006
Wildlife Inventory Plan	2007
Endangered Species Monitoring Plan	2008
Fire Management Plan (Update)	2008 (Current Plan dated 2001)
Law Enforcement Plan	2010
Visitor Services Plan	2010
Predator Management Plan	2010
Forest Management Plan	2014
Archaeological Resource Protection Plan	2015

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SECTION B. APPENDICES

## Appendix I. Glossary

<i>Adaptive management</i>	The process of implementing projects within a framework of scientifically driven experiments to test predictions and assumptions outlined within the comprehensive conservation plan. The analysis of the outcome of project implementation helps managers determine whether current management should continue as is or be modified to achieve desired conditions.
<i>Alternative</i>	A set of objectives and strategies needed to achieve refuge goals and desired future conditions.
<i>Anadromous</i>	Going from salt water to fresh water; such is said of salmon, shad, snook, or tarpon.
<i>Approved acquisition boundary</i>	A project boundary that the Director of the Fish and Wildlife Service approves upon completion of the detailed planning and environmental compliance process.
<i>Basal Area</i>	The cross-sectional area, in square feet, of a tree measured at diameter at breast height (4.5 feet above ground).
<i>Breeding Bird Survey</i>	A cooperative program of the Fish and Wildlife Service and the Canadian Wildlife Service for monitoring population changes in North American breeding birds by using point counts along roads (Koford et al., 1994).
<i>Biological diversity</i>	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.
<i>Biological integrity</i>	The biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.
<i>Canopy</i>	A layer of foliage; generally the upper-most layer in a forest stand. It can be used to refer to mid- or under-story vegetation in multi-layered stands. Canopy closure is an estimate of the amount of overhead tree cover (also canopy cover).
<i>Categorical exclusion</i>	A category of actions that do not individually or cumulatively have a significant effect on the human environment, and have been found to have no such effect in procedures adopted by a federal agency pursuant to the National Environmental Policy Act.
<i>CFR</i>	Code of Federal Regulations.

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<i>Compatible use</i>	An appropriate wildlife-dependent recreational use or any other use on a refuge that is within the mandates laid down in the National Wildlife Refuge System Improvement Act of 1997; the intent of the Congress in the Act of 1997; or in the ■Final Internal Draft■ document of appropriate uses on a national wildlife refuge. The refuge manager may also determine if an activity will or will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge.
<i>Comprehensive conservation plan</i>	A document that describes the desired future conditions of a refuge and provides long-range guidance and management direction in order to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates.
<i>Conservation easement</i>	A legal document that provides specific land-use rights to a secondary party. A perpetual conservation easement usually grants conservation and management rights to a party in perpetuity.
<i>Cooperative agreement</i>	A simple habitat protection action in which no property rights are acquired. An agreement is usually long term and can be modified by either party. Lands under a cooperative agreement do not necessarily become part of the National Wildlife Refuge System.
<i>Corridor</i>	A route that allows movement of individuals from one region or place to another.
<i>Cover type</i>	The present vegetation of an area.
<i>Cultural resources</i>	The physical remains of human activity (e.g., artifacts, ruins and burial mounds) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, such as a sacred area of native peoples) of an area. It includes historically, archaeologically, and/or architecturally significant resources.
<i>Cultural resource inventory</i>	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).

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<i>Cultural resource overview</i>	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 background or literature search described in Section VIII of the Cultural Resources Management Handbook (Service Manual 614 FW 1.7).
<i>Diversity</i>	Variety; usually used in reference to the number of species or living organisms in a given area, including some reference to their abundance.
<i>Disturbance</i>	Significant alteration of habitat structure or composition. May be natural (e.g., fire) or human-caused (e.g., timber harvest).
<i>Early succession</i>	Describes vegetative communities which have recently been disturbed.
<i>Ecological succession</i>	The orderly progression of an area through time from one vegetative community to another in the absence of disturbance.
<i>Ecosystem</i>	A dynamic and interrelated complex of plant and animal communities and their associated non-living environment.
<i>Ecosystem management</i>	Management of natural resources using system-wide concepts to ensure that all components and basic processes of an ecosystem are maintained indefinitely.
<i>Edge effect</i>	The tendency of a transitional zone between communities to support more species and higher population densities than any of the surrounding communities.
<i>Endangered species</i>	Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range.
<i>Endangered species (state)</i>	A plant or animal species in danger of becoming extinct or extirpated in a particular 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.
<i>Endemic species</i>	Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.
<i>Environmental assessment</i>	A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.

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<i>Estuarine</i>	Deposited in an estuary; an inlet or arm of the sea where salt water and fresh water meet.
<i>Even-aged forests</i>	Forests that are composed of trees with a time span of less than 20 years between oldest and youngest individuals.
<i>Even-aged management</i>	A silvicultural method, designed primarily for timber production, in which all trees in a stand are of one age/size class. The forest is regulated by developing equal areas in each age/size class.
<i>Exotic species</i>	A non-indigenous or alien species, or one introduced to this state, either purposefully (horticulture trade) or accidentally, that escaped into the wild where it reproduces on its own, either sexually or asexually. Any introduced plant or animal species that is not native to the area and may be considered a nuisance.
<i>Fauna</i>	All the vertebrate and invertebrate animals of an area.
<i>Federal trust resources</i>	A trust is something managed by one entity for another who holds the ownership. The Fish and Wildlife Service holds in trust many natural resources for the people of the United States of America as a result of federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, and native plant or wildlife species found on national wildlife refuges.
<i>Federal trust species</i>	All species where the Federal Government has primary jurisdiction, including federally threatened and endangered species, migratory birds, anadromous fish, and certain marine mammals.
<i>Fee title</i>	The acquisition of most or all of the rights to a tract of land. There is a total transfer of property rights with the formal conveyance of a title. While a fee title acquisition involves most rights to a property, certain rights may be reserved or not purchased, including water rights, mineral rights, or use reservation (the ability to continue using the land for a specified time period, or the remainder of the owner's life).
<i>Feral</i>	A wild, free-roaming animal; may be a domestic escapee.
<i>Fire regime</i>	Description of the frequency, severity, and extent of fire that typically occurs in an area or vegetative type.
<i>Flora</i>	All the plant species of an area.
<i>Forb</i>	Broad-leaved herbaceous plant.

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<i>FONSI</i>	Finding of No Significant Impact. 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.
<i>Fragmentation</i>	The process of reducing size and connectivity of habitat patches. The disruption of extensive habitats into isolated and small patches.
<i>Fuel</i>	Living and dead plant material that is capable of burning.
<i>GIS</i>	Geographic Information System. A computer based system for the collection, processing, and managing of spatially referenced data. GIS allows for the overlay of many data layers and provides a valuable tool for addressing resource management issues.
<i>Goals</i>	Descriptive statements of desired future conditions.
<i>Habitat</i>	The place where an organism lives. The existing environmental conditions required by an organism for survival and reproduction.
<i>Habitat restoration</i>	Management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy forest lands, rangelands, and aquatic systems.
<i>Herbicide</i>	A chemical agent used to kill plants or inhibit plant growth.
<i>Home range</i>	The area supporting the daily activities of an animal, generally throughout the year.
<i>Hydrological</i>	Involving water flows or their distributions as related to evaporation, or flow to freshwater marshes, saltwater marshes, seas, estuaries, etc.
<i>Indicator species</i>	Plant or animal species that are assumed to be sensitive to habitat changes and represent the needs of a larger group of species.
<i>Indigenous Inholding</i>	Living in and native to a specific area or environment. Privately owned land inside the boundary of a national wildlife refuge.
<i>Integrated pest management</i>	Methods of managing undesirable species (such as weeds) including: education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.

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<i>Invasive species</i>	A native or non-native plant that has flourished beyond its normal constraints, due to changes in its natural environment.
<i>Issue</i>	Any unsettled matter that requires a management decision.
<i>Late succession</i>	Describes vegetative communities that have passed through the early stages of ecological succession in the absence of any disturbance.
<i>Metapopulation</i>	A set of interacting populations of the same species.
<i>Mid-story</i>	A layer of foliage intermediate in height between canopy and groundcover, litter layer, or soil surface.
<i>Mid-succession forest</i>	A forest generally characterized by even-aged structure resulting from human disturbance such as timber harvest. It may contain mature trees but, as a whole, does not exhibit functional or structural characteristics associated with old growth conditions.
<i>Migratory</i>	Pertaining to the seasonal movement from one area to another and back.
<i>Mitigation</i>	Reduction of negative impacts.
<i>MMS</i>	Maintenance Management System. A national database which contains the unfunded maintenance needs of each refuge. Projects included are those required to maintain existing equipment and buildings, correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.
<i>Monitoring</i>	The process of collecting information to track changes of selected parameters over time.
<i>National Environmental Policy Act</i>	Requires all federal agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this Act with other planning requirements, and prepare appropriate policy documents to facilitate better environmental decision making.
<i>National Wildlife Refuge</i>	A designated area of land or water, or an interest in land or water, within the National Wildlife Refuge System.
<i>National Wildlife Refuge System</i>	A national network of lands and waters administered 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.

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<i>Native species</i>	A species that, other than as a result of an introduction, historically occurred or currently occurs in a particular ecosystem.
<i>Neotropical migratory birds</i>	Birds that migrate from North America back and forth to South or Central America. These birds usually breed in North America and winter in the Caribbean, or South or Central America. Usually this term is inclusive of many passerines (perching birds) and shorebirds.
<i>Notice of Intent (NOI)</i>	In the case of a federal action, such as analyzed in this documentation, an NOI is a notice that a comprehensive conservation plan and associated National Environmental Policy Act document will be prepared and considered (40 CFR 1508.22). Published in the <i>Federal Register</i> .
<i>Notice of Availability (NOA)</i>	An NOA is a notice that documentation is available to the public on a federal action, in this case, the comprehensive conservation plan. Published in the <i>Federal Register</i> .
<i>Objective</i>	A concise and, where possible, quantitative target statement of what will be achieved. Objectives are derived from goals and provide the basis for determination of specific management strategies. They should be attainable and time-specific.
<i>Partnerships</i>	A mutually beneficial, joint relationship between two agencies or an agency and landowner, etc.
<i>Pets</i>	Any domesticated animal.
<i>Planning area</i>	An area that may include lands outside existing refuge planning unit boundaries that are being studied for inclusion in the unit and/or partnership planning efforts. It may also include watersheds or ecosystems that affect those lands.
<i>Planning team</i>	Prepares the comprehensive conservation plan. Planning teams are interdisciplinary in membership and function. A planning team generally consists of the planning team leader; refuge manager and staff biologists; staff specialists or other representatives of Service programs; ecosystems, or regional offices; and state partnering wildlife agencies, as appropriate.
<i>Plant association</i>	A classification of plant communities based on the similarity in dominance of all layers of vascular species in a climax community.

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<i>Plant community</i>	An assemblage of plant species that is unique in its composition; that occurs in particular locations under particular influences; that is a reflection or integration of the environmental influences on the site, such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; and that denotes a general kind of climax plant community.
<i>Preferred alternative</i>	The alternative identified in the draft comprehensive conservation plan and selected by the Fish and Wildlife Service as the one to best achieve the refuge purposes, vision, and goals.
<i>Prescribed fire</i>	A planned or intentional fire set by resource land managers to improve or restore wildlife habitat and reduce potentially dangerous fire fuel loads, also known as ■controlled burn.●
<i>Public</i>	Individuals, organizations, and groups; officials of federal, state, and local government agencies; Native American 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.
<i>Public involvement</i>	A process that offers affected 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.
<i>Record of decision (ROD)</i>	A concise public record of decision prepared by a Federal agency, pursuant to the National Environmental Policy Act, 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).
<i>Refuge boundary</i>	Lands acquired by the Fish and Wildlife Service within the current approved acquisition boundary.
<i>Refuge purposes</i>	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 or part of a refuge.

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<i>Refuge revenue sharing</i>	A 1978 Act (Public Law 95-469) which authorizes payments to counties in which Service-owned land is located. The amount of the payment is computed based on things such as the appraised value of Service fee land, number of acres of fee land, and net receipts collected by the Service for certain activities permitted on reserve lands (lands withdrawn from the public domain).
<i>Refuge use</i>	Any activity on a refuge, except administrative or law enforcement activity, carried out by, or under the direction of, an authorized Service employee.
<i>Regeneration</i>	A silvicultural method of harvesting and establishing tree reproduction at the same time.
<i>RONs</i>	Refuge Operating Needs System. A national database which contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates.
<i>Rotation</i>	Number of years between regeneration events in an even-aged management of forests.
<i>Scoping</i>	Process for determining the scope of issues to be addressed by a comprehensive conservation plan and for identifying the significant issues. Involved in the scoping process are federal, state, and local agencies, private organizations, and individuals.
<i>Scrub habitat</i>	A distinct and imperiled xeric vegetative community growing on high sandy ridges. This rapidly drained, dry plant community structure is characterized by an open, canopy-free landscape dominated by low shrubs interspersed with open patches of sand. Often sand pines are a component of this habitat type, but in a healthy habitat they do not dominate the vegetation composition.
<i>Service</i>	Fish and Wildlife Service; the federal agency, under the Department of the Interior, which guides the management of the refuge.
<i>Shrub</i>	A plant usually with several woody stems; a bush. A shrub differs from a tree by its low height.
<i>Silviculture</i>	The theory and practice of controlling the establishment, composition, structure, and growth of forests to achieve management objectives. Primarily developed for timber production, silviculture can be used for a variety of purposes including biological conservation.
<i>Sink</i>	Habitat in which local mortality exceeds local reproductive success for a given species.

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<i>Sink population</i>	Population in low-quality habitat with a death rate exceeding the birth rate, thus depending on immigrants from a source population to maintain its density.
<i>Snag</i>	Standing dead tree.
<i>Source</i>	Habitat in which local reproductive success exceeds local mortality for a given species.
<i>Source population</i>	Population in high-quality habitat with a birth rate significantly exceeding mortality, and excess individuals leaving as migrants.
<i>Special status species</i>	Plants or animals which have been identified through either federal law, state law, or agency policy, as requiring special protection or monitoring. Examples include federally listed endangered, threatened, proposed, or candidate species; state-listed endangered, threatened, candidate, or monitor species; Fish and Wildlife Service species of management concern and species identified by the Partners-in-Flight Program as being of extreme or moderately high conservation concern.
<i>Species</i>	A group of organisms that have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.
<i>Species of management interest</i>	Those plant and animal species, while not falling under the definition of special status species, that are of management interest by virtue of being federal trust species such as migratory birds, important game species including white-tailed deer, furbearers such as American marten, important prey species including red-backed vole, or significant keystone species such as beaver.
<i>Sound professional judgement</i>	A finding, determination, or decision that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of the National Wildlife Refuge System Administration Act and other applicable laws.
<i>Step-down management plans</i>	Plans which provide the details necessary to implement management strategies and projects identified in the comprehensive conservation plan.
<i>Strategy</i>	A general approach or specific action to achieve objectives.
<i>Threatened species</i>	Those plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the <i>Federal Register</i> .

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<i>Threatened species (state)</i>	A plant or animal species likely to become endangered in a particular state within the near future if factors contributing to population decline or habitat degradation or loss continue.
<i>Translocation</i>	Artificial movement of wild organisms between or within populations to achieve management objectives. Originally referring to the movement of animals from captive to wild populations, the term has been expanded to include movements (by artificial means) within and between wild populations.
<i>Understory</i>	Any vegetation with canopy below or closer to the ground than canopies of other plants.
<i>Uneven-aged management</i>	A silvicultural method designed primarily for timber production in which trees of at least three age classes are present in the same stand. Stands are regulated by size class structure or volume.
<i>Vegetation</i>	Plants in general, or the sum total of the plant life in an area.
<i>Vegetation/habitat/ forest cover type</i>	Land classification system based upon the concept of distinct plant associations.
<i>Vision Statement</i>	A concise statement of the desired future condition of the planning unit, based primarily upon the Refuge System mission, specific refuge purposes, and other relevant mandates (Draft Service Manual 602 FW 1.5).
<i>Watershed</i>	The region draining into a river, river system, or body of water.
<i>Wetland</i>	Areas such as lakes, marshes, and streams that are inundated by surface or ground water for a long enough period of time each year to support, and do support under natural conditions, plants and animals that require saturated or seasonally saturated soils.
<i>Wildfire</i>	An uncontrolled fire started naturally by means such as lightning, or accidentally/intentionally by man. Due to its intense nature, it's often more damaging to native plant communities and resident wildlife than prescribed (controlled) fire.
<i>Wildlife-dependent recreation</i>	Uses on a national wildlife refuge that involve hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, as identified in the National Wildlife Refuge System Improvement Act of 1997.
<i>Wildlife management</i>	The art and science of producing, maintaining, benefiting, and/or enhancing wildlife populations and their associated habitats.



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## *Appendix III. Relevant Legal Mandates*

### **National Wildlife Refuge System Authorities**

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

As part of this responsibility, the Service manages the National Wildlife Refuge System. This system is the only nationwide system of federal land managed and protected for wildlife and their habitats. The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

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

### **Key Legislation/Policies**

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

#### *Migratory Bird Treaty Act (1918)*

This Act designates the protection of migratory birds as a federal responsibility. It enables the setting of seasons and other regulations including the closing of areas, federal or non-federal, to the hunting of migratory birds.

#### *Migratory Bird Conservation Act (1929)*

This Act establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

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

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*Refuge Revenue Sharing Act of 1935, as amended (16 U.S.C. 715s)*

This Act provides for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges. Public Law 88-523 (1964) revised this Act and required that all revenues received from refuge products, such as animals, timber and minerals, or from leases or other privileges, be deposited in a special U.S. Treasury account and net receipts distributed to counties for public schools and roads. Payments to counties were established as: 1) on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land; and 2) on land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601-1607, 90 Stat. 2662), payment in lieu of taxes on public lands. The current and proposed management of this refuge under this comprehensive conservation plan is in compliance with this Act.

*Land and Water Conservation Fund Act of 1948*

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

*National and Community Service Act of 1960 (42 U.S.C. 12401:104 Stat. 3127)*

Public Law 101-610, signed November 16, 1960, authorizes several programs to engage citizens of the United States in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Several provisions are of particular interest to the Fish and Wildlife Service.

*American Conservation and Youth Service Corps*

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

*Fish and Wildlife Act (1956)*

This Act established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

*Fish and Wildlife Coordination Act (1958)*

This Act allows the Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

*Refuge Recreation Act (1962)*

This Act allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage these uses. It authorizes construction and maintenance of recreational facilities, as well as the acquisition of land for incidental

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fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the collection of user fees.

*Land and Water Conservation Fund Act (1965)*

This Act authorizes the use of receipts from the sale of surplus federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

*National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee. (Refuge Administration Act)*

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 for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the refuge system; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography and environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the System; and requires a comprehensive conservation plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

*Architectural Barriers Act (1968)*

This Act requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

*National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852), as amended by Public Law 94-52, July 3, 1975, 89 Stat. 258, and Public Law 94-83, August 9, 1975, 89 Stat. 424)*

Title I of the National Environmental Policy Act requires that all federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment." The statute stipulated the factors to be considered in environmental impact statements, and required that federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unquantified environmental values are given appropriate consideration, along with economic and technical considerations. Title II of this statute requires annual reports on environmental quality from the President to the Congress, and established a Council on Environmental Quality in the Executive Office of the President with specific duties and functions.

*Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended*

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

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*Rehabilitation Act (1973)*

This Act requires that programmatic and physical accessibility be made available in any facility funded by the Federal Government, ensuring that anyone can participate in any program.

*Clean Water Act (1977)*

This Act requires consultation with the U.S. Army Corps of Engineers for major wetland modifications.

*Executive Order 11988, Flood Plain Management*

The purpose of this Executive Order, signed May 24, 1977, is to prevent federal agencies from contributing to the "adverse impacts associated with occupancy and modification of flood plains" and the "direct or indirect support of flood plain development." In the course of fulfilling their respective authorities, federal agencies "shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains."

*Fish and Wildlife Improvement Act of 1978*

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

*Emergency Wetlands Resources Act (1986)*

The purpose of the Act is "To promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes." This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act also requires the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan, requires the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund an amount equal to import duties on arms and ammunition.

*North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401-4412)*

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

*Federal Noxious Weed Act (1990)*

This Act requires the use of integrated management systems to control or contain undesirable plant species; and an interdisciplinary approach with the cooperation of other federal and state agencies.

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*Environmental Education Act of 1990 (20 U.S.C. 5501-5510; 104 Stat. 3325):*

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

*Americans With Disabilities Act (1992)*

This Act prohibits discrimination in public accommodations and services.

*Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)*

This Order defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the system.

*Executive Order 13007, Indian Sacred Sites (1996)*

This Order directs federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, to avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, to maintain the confidentiality of sacred sites.

*National Wildlife Refuge System Improvement Act (1997)*

Public Law 105-57, amends the National Wildlife Refuge System Act of 1966 (16 U.S.C. 668dd-ee), providing guidance for management and public use of the National Wildlife Refuge System. The Act mandates that the Refuge System be consistently directed and managed as a national system of lands and waters devoted to wildlife conservation and management. The Act establishes priorities for recreational uses of the Refuge System. Six wildlife-dependent uses are specifically named in the Act: fishing, hunting, wildlife observation, wildlife photography, and environmental education and interpretation. These activities are to be promoted on the Refuge System, while all non-wildlife dependent uses are subject to compatibility determinations. A compatible use is one which, in the sound professional judgement of the refuge manager, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s). As stated in the Act, "The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." The Act also requires development of a comprehensive conservation plan for each refuge and management of each refuge consistent with that plan. When writing a plan, planning for expanded or new refuges, and when making management decisions, the Act requires effective coordination with other federal agencies, state fish and wildlife or conservation agencies, and refuge neighbors. A refuge must also provide opportunities for public involvement when making a compatibility determination or developing a comprehensive conservation plan.

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## Historic Preservation Acts

### *Antiquities Act (16 U.S.C. 431 - 433)*

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

### *Historic Sites, Buildings and Antiquities Act (16 U.S.C. 461-462, 464-467)*

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

### *Archaeological and Historic Preservation Act (16 U.S.C. 469-469c)*

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

### *National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n)*

Public Law 89-665, approved October 15, 1966, (80 Stat. 915) and repeatedly amended, provided for preservation of significant historical features (buildings, objects, and sites) through a grant-in-aid program to the states. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d).

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

### *Archaeological Resources Protection Act (16 U.S.C. 470aa - 47011)*

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

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*Public Law 100-588, approved November 3, 1988 (102 Stat. 2983)*

This Law lowered the threshold value of artifacts triggering the felony provisions of the Act from \$5,000 to \$500, made attempting to commit an action prohibited by the Act a violation, and required the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the nation.



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# *Appendix IV. Summary Of Public Comments*

## **PUBLIC SCOPING COMMENTS**

In accordance with Fish and Wildlife Service guidelines and National Environmental Policy Act recommendations, public involvement has been a crucial factor throughout the development of the Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge. The following briefly summarizes the efforts taken to solicit public input and presents the results of the public consultation process. A detailed description of that process is provided in Chapter III of the Comprehensive Conservation Plan.

On February 19, 2003, the first of a series of public meetings was held in Gulf Shores, Alabama, after the initial development of management recommendations based on the Biological Review in 2000 and the Public Use Review in 2001. A planning team was formed to identify issues and concerns regarding the refuge and its wildlife, habitats, and management. Additional meetings were held from March through June 2003, to provide continuous information to the public and to solicit further input. Efforts were taken to widely announce public meetings by publishing dates, times, and locations in local newspapers, as well as on flyers distributed to everyone on the comprehensive conservation plan mailing list.

A comment packet was designed to identify the importance of different refuge features and opportunities for the public, while also allowing for “free-hand” comments on values, issues, and concerns related to the refuge. This packet was available at all public meetings and at the refuge office and the Alabama Convention and Visitors Bureau, and it could also be requested via mail or e-mail. In addition, it was sent out to everyone on the plan’s mailing list, to the sea turtle volunteers, and to the Friends of Bon Secour National Wildlife Refuge. Out of an estimated total of 500 comment packets thus distributed to the public, 102 completed forms (about 20 percent) were returned to the refuge.

The majority of responses (75 percent) came from Alabama residents, most of them living within an hour’s drive of the refuge. Out-of-state respondents included 10 different states within the United States and one visitor from overseas (Japan). Sixty-nine of all respondents (67 percent) indicated no affiliation with any organization, while the remaining 23 percent represented eight different organizations, predominantly the above-mentioned Friends group. Eighty-nine percent of all respondents said they had visited the refuge at least once.

Results show that the vast majority of the participants in this poll consider wildlife and ecosystem protection and conservation as the most important issues for the refuge to address. These were followed by a desire for more public education and involvement, increased law enforcement, and control of invasive species. Issues receiving the least support were mostly related to further development of recreational opportunities. Improving fishing opportunities and offering more recreational opportunities were disfavored by a majority of the respondents. A complete list of issues and their rankings is provided in Table 12.

**Results of public evaluation of issues related to refuge management.**

<i>Issue</i>	<i>Agree or strongly agree</i>	<i>Disagree or strongly disagree</i>	<i>No opinion</i>	<i>Blank</i>
Conserve habitat for native wildlife and plants	101	0	1	0
Protect threatened, endangered species and wildlife of special concern	100	0	1	1
Protect the whole biological system	98	1	3	0
Remove and control exotic, invasive species	90	3	7	2
Work closely with community organizations	90	1	8	3
Expand volunteer program	89	2	10	1
Develop environmental education and interpretive programs	88	2	10	2
Increase law enforcement to protect refuge resources	87	6	8	1
Promote Bon Secour Refuge to increase public knowledge and participation in refuge programs	83	4	12	3
Increase staff and funding to support refuge programs	80	6	14	2
Limit amount of new public use facilities	79	18	4	1
Increase research opportunities and funding	74	8	17	2
Limit public use of Bon Secour Refuge to protect wildlife	69	26	7	0
Build visitor and education center	66	12	17	7
Improve public use facilities	51	32	16	3
Improve accessibility of refuge facilities	46	28	22	6
Improve fishing opportunities	36	37	27	2
Provide more recreational opportunities	26	64	11	1

Among a choice of recreational activities on the refuge, wildlife observation, hiking, and nature study ranked topmost, listed on 87, 77, and 71 percent, respectively, of all the forms completed. Least in demand was fishing (22 percent), sea kayaking (18 percent), and boating (14 percent). Entries under “other activities” included birding, plant study, and volunteering, among others. Table 13 presents a complete list of activities and the degree of their preference by the public.

**Preferred activities on the refuge.**

<i>Activity</i>	<i>Times listed as preferred</i>
wildlife observation	87
Hiking	77
nature study	71
interpretation/environmental education	63
photography	60
beach activities	36
Fishing	22
sea kayaking	18
Boating	14
others (specified below)	13
Birding	6
plant study	2
Controlled camp fires	1
turtle nest sitting	1
Volunteer	1
dog walking	1
Blank	1

When asked to list the values of the refuge, wildlife and habitat conservation was named the most often (by 45 respondents), followed by the natural environment (37), hiking and trails (21), and wildlife observation (20). Also repeatedly mentioned were beauty, birding, serenity, solitude, educational values, uniqueness, and other features mostly similar to those.

Listed a total of 57 times, the impacts of overdevelopment and overuse took a clear lead. Twenty-two respondents were concerned about commercialization and a possible shift of emphasis from wildlife to people, while both lack of funding and the inability to acquire more land were named 16 times. Other issues related to litter, insufficient law enforcement, need for more educational opportunities, and inadequate staffing.

On the list of unacceptable activities on the refuge, motor vehicles, motor boating, and camping made up the top three, with 21, 20, and 20 nominations, respectively. Hunting, pets, all-terrain vehicles, and jet skis were also rejected by many. Further listings included anything that impacts wildlife, fires, fishing, large picnics, off-trail hiking, and biking.

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## **DRAFT COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL ASSESSMENT COMMENTS**

*Summary of, and the Service's Response to, Public Comments Received on the Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) for Bon Secour National Wildlife Refuge.*

### **Introduction**

In February 2005, the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Bon Secour National Wildlife Refuge was completed. The Draft CCP/EA outlined four alternative scenarios for managing the refuge over the next 15 years. Alternative D was identified as the "Service's Preferred Action" in this document. It is the alternative recommended to best achieve the Refuge System mission, and refuge purposes and goals. The Draft CCP/EA was released for 30 days of public review, with the comment period ending on April 8, 2005.

All written and oral correspondence received during the public comment period was evaluated. This section of the document is our response to the substantive comments that were received. Based on the analysis in the Draft CCP/EA, and evaluation of public comments, the Preferred Action was modified to include the following changes:

- 1) During preparation of this CCP, Critical Habitat was designated for wintering piping plovers, including a section of the Fort Morgan Unit and all of the Little Dauphin Island Unit. Changes were made to reflect this designation and the Preferred Action was modified to include more discussion and evaluation of effect of the various alternatives on the piping plover and its habitat.
- 2) The refuge will evaluate establishing a kayak/canoe launch site on the west side of the Little Point Clear Unit affording boating enthusiast access to the St. Andrews Bay area.
- 3) The refuge will work with Baldwin County officials and attempt to address the parking problems along Mobile Street, a high public use beach access point.
- 4) The refuge will recommend to the Bureau of Land Management that, when repaired, the new Mobile Street boardwalk should terminate on the beach in an easterly direction.

### **Summary of Comments Received**

A total of 10 individuals, agencies, and organizations provided comments by way of oral testimony at a public meeting or through submission of written or electronic documents.

A formal public meeting was held on March 29, 2005, 6:30 – 9:00 p.m. at the Adult Activity Center in Gulf Shores Alabama.

Some people at the public meeting submitted their comments in writing instead of giving oral testimony, others did both. Written comments came in the form of letters and electronic mail.

One written comment was received from the American Kennel Club.

Six written comments were received from individuals, including one comment from the public meeting, one electronic mailing, and four letters.

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In the following discussions, issues and comments raised during public scoping and the planning team's responses to them are identified.

### **Fish and Wildlife Population**

**Comment:** Refuge patron commented at the public meeting as to whether or not the refuge is doing anything about coyote predator control?

**Response:** In the Draft CCP, under Management Direction, Goal 1. Fish and Wildlife Population, Objective 2 states: By 2010, develop and implement predator management step-down plan for non-native species. Alternative D, the Preferred Alternative, will initiate tracking surveys through Alabama beach mouse habitat to determine population trends of coyotes, red foxes, and feral and free ranging cats.

### **Habitats**

**Comment:** Refuge patron commented at the public meeting that sand fencing was a hazard to clean up. Has the refuge ever checked to see how fast the sand fence builds up? Are you (refuge) against putting hay bales on the beach? Patron feels that using septic tank systems works better than sand fence or hay and it can grow sand dunes faster than anything.

**Response:** Hurricane Ivan, a Category 3 hurricane, impacted more than 5 miles of dunes on Bon Secour Refuge, habitat that is vital to the Alabama beach mouse. Installing sand fencing has been empirically proven to increase the re-establishment of dunes post hurricane. Bon Secour Refuge has placed high priority on installing sand fencing in order to facilitate dune restoration and provide a medium for the natural propagation of sea oats. Post hurricane, debris that poses a safety hazard to the visiting public will be a high priority to remove. In terms of using hay for dune restoration, the refuge is not interested in increasing the potential of introducing exotic plant species, which may be contained in hay bales. Also, the refuge has not discovered research that reveals that using septic tanks is more efficient than sand fences concerning dune restoration.

**Comment:** Refuge patron commented at the public meeting that Bon Secour's prescribed burning program has killed live oak trees, 100-year old pines, and that more than 75 percent of the trees are killed. The prescribed burning program is running coyotes off the refuge onto private property. Commenter suggests that we conduct an EIS before resuming further prescribed burning operations. A member of the Mobile Bay Audubon Society (MBAS) commented that "too much focus on burning...." Are there adequate water mains, fire trucks, fire breaks?

**Response:** As stated in the Draft CCP, under Refuge Administration and Management, Land Protection and Conservation, the 1970s brought an onslaught of development, which intensified following Hurricane Frederic. Private development (i.e., rural interface), ranging in value from mid-one-hundred thousand to multi-millions of dollars, currently is often juxtaposed on or near refuge boundaries. Having habitats in a more than 70-year unburned condition, with ladder fuels connecting ground fuels with sand pine over-story crowns, necessitates that the refuge pursue actions that break up or eliminate the current dangerously high fuel loads. Current observed habitat/stand conditions do not represent historical conditions, which were represented by more open stands with less of the overall basal area being represented by sand pine.

Since 1990, there have been 15 wildfires ignited on refuge lands. Thirteen of the fifteen fires were human caused. In order to protect refuge lands and expensive private assets, Bon Secour Refuge will continue to use prescribed fire to reduce the potential for catastrophic wildlife occurrences.

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Prescribed fire is considered a Categorical Exclusion, which is a category of actions that does not individually or cumulatively have a significant effect on the human environment and has been found to have no such effect in procedure adopted by a Federal agency pursuant to NEPA (40 CFR 1508.4). Furthermore, Department of Interior policy 516 Departmental Manual, Appendix 2, 1.12 states that hazardous fuel reduction activities are exempt from an environmental impact statement.

The Fort Morgan Peninsula is a major migratory route for songbirds in the spring and fall. During songbird fallouts, Bon Secour provides foraging habitat for energy-depleted migratory birds. Alternative D, the Preferred Alternative, will pursue research opportunities, which will refine and promote adaptive techniques involving the use of prescribed fire to provide optimum foraging/nesting habitat for migrating songbirds.

Bon Secour Refuge ensures that all necessary safety precautions are mitigated (i.e., public notices, fire trucks, fire personnel, contingency resources, fire prescription elements, smoke management specifications, current and projected fire weather forecasts, planned operations' personnel and equipment on-site, and operational, contingency resources checked and available, permits and clearances obtained, and pre-burn considerations identified in the prescribed fire plan) prior to initiating a prescribed fire operation.

**Comment:** A refuge patron stated via letter that she supported reduced "human interference" with the refuge's proposal to conduct research on creating Alabama beach mouse habitat. "You (the refuge) have already identified scrub habitat as ideal for the Alabama beach mouse. Now leave it alone."

**Response:** 94 Stat. 483, dated June 9, 1980 (Act to establish the Bon Secour National Wildlife Refuge) recognizes that the refuge is "to serve as a living laboratory for scientists and students...." Due to the vital role the refuge plays in terms of recovery for the endangered Alabama beach mouse, the refuge wants to conduct research to determine if habitat can be enhanced through management of scrub/scrub habitat. This small-scale research could lead to cutting edge management recommendations vital to beach mouse recovery. Consultation with the Ecological Services, Daphne Field Office, along with collaboration with a reputable university, coupled with appropriate funding, will determine if this endeavor comes to fruition.

**Comment:** The same commenter noted that the refuge should "be very careful in timber sales and allowing timber companies in refuge areas. Timber companies "can be very destructive.... Herbicides should be carefully considered, with all the endangered, rare species on the refuge."

**Response:** The CCP calls for developing a Forest Management Step-down Plan. This step-down plan will describe the refuge's desired future condition (i.e., managing for historical forest/habitat types rather than current stand structures). The Forest Management Plan will recommend silvicultural, prescribed fire, and mechanical techniques that may be employed to reach desired condition goals and objectives. Due to the refuge's location from the closest lumber mill, management does not envision timber sales as a viable option at this time.

Bon Secour seeks to use the most environmentally safe techniques to eradicate invasive plant species, such as Chinese tallow and cogon grass. To date, the refuge has used volunteers and staff to apply herbicides to the very limited areas where Chinese tallow and cogon grass occur. The National Pesticide Use Proposal (PUP) program determines annually which herbicides/pesticides can be used on refuges in the National Wildlife Refuge System based upon environmental considerations, such as toxicity to wildlife and proximity to wetlands. The refuge also consults with Ecological Services, Daphne Field Office, if herbicides/pesticides are to be applied in endangered species habitat.

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**Comment:** The same commenter asked what is increased basal area?

**Response:** The refuge is proposing to use current silvicultural and prescribed fire techniques to promote historical stand characteristics on the refuge. Historically, the refuge had forested stands, which were more open with a grass under story (habitat for gopher tortoise and indigo snake). Basal area is the cross-sectional area, in square feet, of a tree measured at diameter at breast height (4.5 feet above ground). By combining silviculture and prescribed fire applications, the refuge will reduce the potential for catastrophic wildfire and help return forested stands to historical conditions.

### **Resource Conservation**

**Comment:** A refuge patron commented at the public meeting that she would support the refuge acquiring land such as back bays, Wolf Bay, Pirates Cove, and bogs near Plash Island. Her concern was that developers are looking to the north side of the intracoastal waterway to develop properties that have high ecological value. Later, she commented whether the refuge could ask Baldwin County to donate the acres to the refuge.

**Response:** After further review, the area described above is outside the current acquisition boundary for the Bon Secour National Wildlife Refuge. The refuge does not have authority to acquire nor accept property outside of its approved acquisition boundary. Our first priority is to continue to acquire property from willing sellers inside our acquisition boundary. At this time, Bon Secour Refuge is not planning to expand its approved acquisition boundary.

**Comment:** A refuge patron commented at the public meeting that the refuge should include horses in the definition of pets.

**Response:** Comments noted and changes made. Pets are defined as all domesticated animals.

**Comment:** Refuge patron commented at the public meeting concerning wanting to know the status of the proposal to transfer lands currently managed by the Bureau of Land Management (BLM) to the Bon Secour Refuge. The commenter mentioned that the transfer of the property has been going on for more than 15 years.

**Response:** The refuge is continuing to work with the Jackson Field Office of the BLM. Currently, BLM is writing a Resource Management Plan, which will present options for the properties juxtaposed near the refuge. Due to the number of endangered species and public use concerns, the refuge sponsors transfer of all the beach front properties from BLM to the Fish and Wildlife Service.

**Comment:** Refuge patron commented at the public meeting concerning the ownership of property between Laguna Key and the area known as the new cut, which was a result of Hurricane Ivan. Commenter supports the refuge either purchase or “bring back into the refuge.”

**Response:** The refuge contends that it owns the property in question up to the existing boundary lines.

**Comment:** A refuge patron noted via letter that the Mobile Bay Audubon Society should be recognized as playing a vital role in establishing the Bon Secour National Wildlife Refuge. The member noted that Audubon Society should be changed to Mobile Bay Audubon Society.

**Response:** The refuge concurs and will recognize the Mobile Bay Audubon Society’s support of the refuge’s establishment.

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**Comment:** The same commenter mentioned evidence of archaeological resources on the Perdue and Little Dauphin Island Units. The member acknowledged her appreciation that cultural resources are a “major factor in management plans.”

**Response:** The CCP calls for conducting a refuge-wide archaeological survey within the next 15 years, Archaeological Resources, Objective 1. A projected timeline is described that will promote safeguarding our rich cultural history.

**Comment:** The same commenter thinks the refuge should consider conducting refuge-wide archaeological surveys within 5 years rather than over the next 15 years.

**Response:** The refuge thanks the commenter for supporting the need to expedite preserving the area’s rich cultural history.

**Comment:** The same commenter indicated that she was glad to see that taking permits were required for boardwalks over sand dunes, requiring conservation easements in deed and record.

**Response:** The refuge thanks the commenter for supporting the desire to continue focusing on resource conservation issues.

**Comment:** The same commenter noted that she is concerned that the refuge will not receive adequate funding to implement Alternative D, the Preferred Alternative. She recommends that we re-consider all of the alternatives, “then push for what can actually be achieved in the next five years. The pendulum may swing then and the new administration may be pro-environment. Maybe an EIS would help the process for the present.”

**Response:** Out of all the alternatives described in the draft CCP, the Preferred Alternative, Alternative D, represents the direction that will balance increased visitation, while promoting a greater appreciation for fish, wildlife, and their habitats. This alternative was developed based on public input and the best professional judgment of the planning team. All of the initiatives that are contained within the CCP will be funding-dependent. Projects and costs associated with increasing personnel are based on implementing the preferred alternative. The refuge feels that Alternative D will not have a significant impact on the quality of the human environment in accordance with section 102(2)(e) of the National Environmental Policy Act and, therefore, an environmental impact statement is not required.

**Comment:** The same commenter wrote that she would support the refuge planting “fleshy fruit and cover in open areas” and suggests that the refuge use other professional bird survey data.

**Response:** The CCP calls for the development of a Forest Management Plan. This plan will describe various silvicultural techniques that are conducive to promoting stand structures that mimic historically open forests with less basal area consisting of large sand pine. The CCP also encourages scientific research in favor of maximizing nesting and foraging habitat for migrating songbirds.

**Comment:** The same commenter indicated that she would support not allowing oil/gas drilling on the refuge.

**Response:** To date, the refuge has not been approached for oil/gas exploration. However, in the event of such a request, the proposal would go through all the appropriate level environmental compliance processes such as Compatibility Determinations, NEPA compliance, and formal consultation with the Ecological Services-Daphne Field Office.

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**Comment:** Refuge patron commented at the public meeting that he hoped that the management direction would include a reciprocal respect by both property owners and wildlife personnel.

**Response:** Comment was noted and the refuge will continue to sponsor working with private landowners on conservation issues.

**Comment:** Refuge patron commented via letter that he supported the proposals for “survey, monitoring, and study of birds.” The commenter is concerned that “even with the addition of a technician that the variety of habitat and the separation of various units may be beyond the capability of one biologist and one technician even if they devoted full time to the effort.” The commenter suggests a “coordinated volunteer program” to offset staffing needs for this endeavor.

**Response:** The CCP describes the role that the refuge plays for migrating songbirds in terms of providing foraging and nesting habitat. Plans are to utilize trained volunteers to support wildlife survey and monitoring programs in the future.

### **Public Use and Environmental Education**

**Comments:** A refuge patron asked at the public meeting whether it would be possible to staff volunteers at the refuge to assist with showings or clerical services.

**Response:** Bon Secour Refuge is always looking for volunteers to assist in programs, such as environmental education, clerical, maintenance, and biological surveys, and suggests that volunteers contact the refuge during normal business hours in order to match interests to priority tasks. Currently, the refuge does not have housing available for long-term volunteers.

**Comment:** A refuge patron at the public meeting questioned the projected time frame for repairing the Mobile Street Dune walkover and sand fencing. Another commenter wrote via letter if the refuge could design the walkover to have the Gulf-side terminus to face east rather than west.

**Response:** The Military Construction Appropriations and Emergency Hurricane Supplemental Appropriations Act, 2005 (PL 108-324) was signed by the President on October 13, 2004. This emergency spending bill provided a total of \$40,552,000 to the Fish and Wildlife Service to respond to various disasters throughout the country. A total of \$34,804,316 (85 percent) was provided to the Southeast Region to restore operations after a series of four major hurricanes. Of this amount, \$3 million was provided to reimburse National Wildlife Refuge System operational accounts, which provided initial response and cleanup throughout the southeast. Priorities will focus on the removal of approximately 174 acres of housing/construction debris, repair damages to refuge quarters for staff, install sand fencing to restore damage to the dune ecosystem, as well as repair damage to public use facilities. The Mobile Street Dune walkover is a high priority to be completed this fiscal year. During the design phase of the rehabilitation of the Dune Walkover, the refuge will pursue changing the direction of the Gulf-side terminus towards the east.

Bon Secour Refuge acknowledges the importance of dunes to the Alabama beach mouse, as well as the protective role dunes play during large storm events. Installing sand fencing in order to begin the dune recovery is a high priority to be completed this fiscal year.

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**Comment:** Refuge patron commented at the public meeting concerning trash coming from the parking lot at the end of Mobile Street. The refuge should consider removing the trash can from the area. The commenter added that dogs are not being kept on leashes and described an incident where his significant other was jumped on by a Great Dane, and wanted a phone number to call to report incidents.

**Response:** The CCP, if funded, would provide more efficient management of our public use facilities. The maintenance position would ensure proper maintenance of our refuge quarters, informational signs, and boundary posting.

The refuge is concerned with continuing to allow patrons to bring domesticated animals on the refuge, specifically in terms of shorebird management, aesthetics, and public safety. The CCP would prohibit visitors from bringing domesticated animals on the refuge. Prohibiting dogs will reduce the potential of confrontation between pets, as well as between pets and visitors. The CCP, if funded, proposes the hiring of a full-time law enforcement officer to ensure compliance with current and future refuge regulations.

**Comment:** Refuge patron commented at the public meeting that the refuge needs to do something about visitors feeding the alligator on Mobile Street.

**Response:** The CCP, if funded, would allow for hiring a full-time officer to ensure compliance with refuge regulations.

**Comment:** Refuge patron commented at the public meeting concerning whether the refuge could charge a fee for access to public areas?

**Response:** The CCP would utilize a self pay station for canoe/kayak strollers at the Pine Beach Trail and develop a permitting system and user fee to allow night fishing at Mobile Point.

**Comment:** Refuge patron commented at the public meeting concerning the proposed kayak trail in the Little Point Clear Unit. The commenter added that the proposed kayak trail location should be moved from the Three Rivers area to the St. Andrews Bay area due to the potential for more favorable winds and enthusiasts could use a historical launch site.

**Response:** The refuge will evaluate establishing a kayak/canoe launch site on the west side of the Little Point Clear Unit affording boating enthusiast access to the St. Andrews Bay area.

**Comment:** Refuge patron commented at the public meeting that the current parking situation at the end of Mobile Street is terrible. Does the refuge plan to improve parking at the end of Mobile Street?

**Response:** Due to the impacts of Hurricane Ivan, the "tear drop" turn around at the end of Mobile Street was inundated with a large volume of beach sand. Also the overflow parking sustained surface damage, and loss of vehicle stops and informational signs. The refuge plans to correct these damages using storm damage appropriations in either FY05 or early in FY06. The CCP proposes increasing public use facilities in the Sand Bayou and the Little Point Clear units. The refuge feels that this will reduce the pressure on the Mobile Street parking area by increasing other opportunities for visitors.

**Comment:** Refuge patron commented at the public meeting concerning whether the refuge is trying to get several organizations together to build a new Visitor Center.

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**Response:** Fund raising for the construction of a new visitor contact station is a top priority in FY05 for The Friends of Bon Secour.

**Comment:** A member of the Mobile Bay Audubon Society (MBAS) commented that “dogs should not be allowed, especially without leashes.... people have been bitten.”

**Response:** The CCP prohibits all domesticated animals on the refuge, with an exception being made for visually or hearing impaired patrons.

**Comment:** The same commenter noted that she supports not allowing bikes, motorized vehicles, or horses on the refuge.

**Response:** Comment is noted and is addressed in the CCP.

**Comment:** The same commenter stated that she supported the refuge for not allowing all-terrain vehicles on the refuge.

**Response:** The refuge does not plan to allow all-terrain vehicles on the refuge in the future.

**Comment:** The same commenter indicated she has had success in contacting vendors and having them donate interpretive signs on boardwalks. Commenter suggests placing a large directional sign to inform visitors to turn right off of Highway 59 onto State Highway 180.

**Response:** The refuge thanked commenter for suggestion, which will benefit the visiting public.

**Comment:** The same commenter stated that she supports not expanding parking areas, “traffic needs to stay at the existing parking lots.” She also supported requiring boat enthusiasts to haul their watercraft down to Gator or Little Gator Lake. The commenter noted that she felt developing a kayak trail or allowing access to the Three Rivers Bay on the eastern side of the Little Point Clear was a “bad idea.”

**Response:** The refuge does not plan to expand existing parking areas. The CCP does call for providing limited access to the Sand Bayou and the Little Point Clear units. Existing trails/fire breaks will be used as walking trails with two parking/trailheads established. These new recreational opportunities will help disperse visitation across the refuge, reducing pressure on current high use areas.

**Comment:** The same commenter noted that elevated boardwalks should be very carefully identified. The refuge should only construct one in an area where usage has been heavy.

**Response:** If fully funded, the CCP proposes installing three boardwalks to reduce impacts to sand dunes. These properties are currently administered by the Bureau of Land Management in Jackson, Mississippi. The refuge is pursuing acquiring these properties through a land exchange, resulting in solidifying refuge ownership, as well as continuing natural resource protection.

**Comment:** The same commenter wrote that she thought there were two Gator Lakes even though the connection may not be that evident

**Response:** The refuge recognizes Gator Lake and Little Gator Lake in the Purdue Unit west of Little Lagoon.

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**Comment:** The same commenter noted that she would support keeping the Little Point Clear Unit “inaccessible.”

**Response:** Currently, the Little Point Clear Unit is open for visitation. The CCP, if fully funded, will provide limited parking and development of a hiking trail in an effort to allow access to a proposed kayak trail in the Little Point Clear unit. This area will only be open for foot traffic beyond the parking area. The refuge is attempting to provide quality outdoor experiences and reduce visitation pressure on current facilities.

**Comment:** The same commenter noted that on Page 99 of the Draft CCP, she had never seen an 8.75 person.

**Response:** For budgetary purposes, one of the positions noted in the CCP is for only  $\frac{3}{4}$  of the year. The number 8.75 refers to actual time needed in terms of a full year.

**Comment:** The same commenter stated that the Mobile Bay Audubon Society had frequent field trips for 20 years in the Perdue Unit and had a spectacular time.

**Response:** The refuge wants to thank the members of the Mobile Bay Audubon Society and more than 100,000 visitors who support the National Wildlife Refuge System and the refuge.

**Comment:** Refuge patron commented at the public meeting that he had concerns and hopes that the management direction of the refuge will include some type of monitoring of automobile traffic during the hours when the refuge is supposedly closed.

**Response:** If the CCP is fully funded, a full-time law enforcement officer will be hired who will ensure compliance with all refuge regulations. The refuge will also coordinate law enforcement operations with the Baldwin County Sheriff’s Office and the city of Gulf Shores.

**Comment:** Refuge patron commented via letter that on “March 29, 2005 at the public hearing, many people spoke with approval of the determination that bringing pets (with specific reference to dogs) on the refuge is incompatible with management objectives and public safety.” The commenter states, “In 2003, as part of the Alabama Breeding Bird Atlas project, a colony of least terns was located on the Gulf State Park premises. He personally walked the beach both at surfside and among the intermediate dunes to locate any nesting birds.” The commenter added that he “found many dog tracks as well as seeing a couple of dogs and found no nesting birds. He didn’t know if “one year would establish a direct correlation, but he believed the literature would certainly support a correlation.” The commenter supports “optimizing” the opportunity for the return of nesting “plovers and least terns.”

**Response:** The CCP, if fully funded, would prohibit the visiting public from bringing domesticated animals onto the refuge, reducing impacts to shore birds and the potential of negative pet versus pet encounters, and reducing risks to the visiting public.

**Comment:** Refuge patron commented via letter that he supports the proposed expansion of hiking and kayaking opportunities. “Besides enhancing the recreation opportunities” the commenter believes that “increasing and dispersing the activities into other areas and units will have an effect of reducing the numbers of persons at any one location and probably reduce the impact of recreational use on wildlife.”

**Response:** Comment noted and the refuge appreciates your support of expanding hiking and kayaking opportunities.

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**Comment:** Refuge patron commented, via letter and fax, that as a tour operator/guide for 13 years, she has taken many visitors to the refuge. “Many are international guests whom have commented to find such a return to nature in such a busy area is remarkable. Spending time with the Draft Comprehensive Plan shows me the intent of the wildlife refuge will not change. Rather, the plan will enhance experience options already in place.” Via fax, she went on to add that “we must find the way to preserve and expand opportunities of the refuge.”

**Response:** The refuge would like to thank the numerous supporters of the National Wildlife Refuge System and of the refuge.

**Comment:** Refuge patron commented via comment sheet that Figure 15 needs to have a street name correction. “Baldwin County” has renamed Gulf Side Avenue, Mobile Street West. The commenter added, “Well done plan.... he hopes it will be approved and acted upon.”

**Response:** Comment noted and changes made.

**Comment:** A representative of the American Kennel Club (AKC) commented via letter that the AKC “strongly objects to this ban. The plan observes that the public recreating on the refuge with their dogs is a historic use of the refuge. We (AKC) take strong issue with the implication in the CCP that persons who enjoy the refuge accompanied by their dogs are engaged in a non-wildlife-dependent use of dog use”. The commenter adds, we (AKC) strongly urge that the ban on dogs be removed from the preferred plan, and that it be replaced by appropriate control measures, such as enforcement of leash laws, limitations on the areas where dogs are allowed, removal of canine feces, and that other similar measures be substituted.

**Response:** When considering a use, whether historical or new, the 1997 Refuge Improvement Act mandates that wildlife and wildlife conservation must come first on refuges. The Refuge Improvement Act further stipulates that all activities occurring on refuges should be compatible with wildlife conservation and the specific purposes for which a refuge was established. This is an important distinction from other public lands and recreation areas; refuges have a narrow management focus and are not multi-purpose lands. Six public uses were identified in the Refuge Improvement Act as the priorities that should be “facilitated” on refuges. Bon Secour Refuge does not have a hunting program that would necessitate the use/presence of dogs. Dog use is not one of the six priority uses, nor are dogs (except human-dependent working dogs) necessary to support the safe and effective conduct of the priority public use programs on the refuge, nor is dog use a wildlife-dependent use of the refuge. Visitors are complaining about aesthetics (canine feces), being intimidated or bitten, or having their pets attacked. The preferred alternative includes the addition of a full-time law enforcement officer. If funds are provided, the refuge would hire a full-time law enforcement officer, however, continuing to allow dog use on the refuge would require that officer to dedicate considerable personnel time to enforcing compliance of an activity that does not support one of our priority uses. The Service has determined that this is not an appropriate use of the refuge since it conflicts with wildlife management objectives, is not a wildlife-dependent use, and is inconsistent with public safety.



# Appendix V. Budget Requests

## REFUGE OPERATING NEEDS SYSTEM (RONS)

RONS Project Name	Project No.	Amount
1. Protect refuge resources and visitors.	RONS 96005	\$159,000
2. Provide outreach and enhance visitor services at Bon Secour National Wildlife Refuge.	RONS 00006	129,000
3. Standardize surveys and monitoring of Alabama beach mice, transient, nesting and wintering songbirds, shorebirds, marshbirds, and herpetofauna.	RONS 96007	139,000
4. Orient and educate visitors.	RONS 04004	500,000
5. Eradicate invasive Chinese tallow trees and cogongrass.	RONS 01001	60,000
6. Protect archeological resources through survey and planning.	RONS 97001	60,000
7. Promote sea turtle conservation along the Alabama coast.	RONS 02001	61,000
8. Evaluate scrub habitat for Alabama beach mouse.	RONS 02002	157,000
9. Use prescribed fire to promote and maintain shrubs for transient songbird population.	RONS 01003	54,000
10. Ecological role of prescribed fire in coastal ecosystems.	RONS 02003	77,000
11. Distribution of birds in fire manipulated habitats.	RONS 02004	75,000
12. Improve maintenance operations and facilities management.	RONS 00007	87,000
13. Protect dune structure and habitat for Alabama beach mice by providing elevated boardwalks for beach access points.	RONS 04005	305,000
14. Delineate rare plant communities.	RONS 01006	22,000
15. Build and maintain databases containing biological resource data and spatial relationships for the Bon Secour National Wildlife Refuge and surrounding coastal environments.	RONS 04001	22,000
16. Manage forest structure to optimize migratory bird and gopher tortoise habitats on the Bon Secour National Wildlife Refuge.	RONS 04002	50,000
17. Provide wildlife-dependent recreational opportunities in the Little Point Clear Unit.	RONS 04006	60,000
<b>TOTAL</b>		<b>\$2,017,000</b>

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**MAINTENANCE MANAGEMENT SYSTEM NEEDS**

<b>MMS Project Name</b>	<b>MMS #</b>	<b>Amount</b>
1. Improve maintenance operations and facilities management.	MMS 00006	\$350,000
2. Enhance wildlife-dependent recreational opportunities on the Jeff Friend Trail.	MMS 02006	48,000
3. Enhance wildlife-dependent recreational opportunities on the Pine Beach Trail.	MMS 02002	39,000
4. Create wildlife-dependent recreational opportunities in the Sand Bayou Unit.	MMS 04001	55,000
5. Provide environmental education opportunities and serve as a training ground for conservation interns.	MMS 97002	161,000
6. Enhance fishing opportunities at Gator Lake.	MMS 02007	41,000
<b>TOTAL</b> (does not include routine vehicle and equipment replacement)		<b>\$694,000</b>

# Appendix VI. Refuge Biota

## WILDLIFE SPECIES THAT HAVE BEEN REPORTED ON THE REFUGE.

Common Name	Scientific Name
<b>BIRDS</b> (• known or suspected to have nested on the refuge, or known to nest locally)	
<b>Loons</b>	
Red-throated Loon	<i>Gavia stellata</i>
Arctic/Pacific Loon	<i>Gavia pacifica</i>
Common Loon	<i>Gavia immer</i>
<b>Grebes</b>	
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Horned Grebe	<i>Podiceps auritus</i>
Red-necked Grebe	<i>Podiceps grisegena</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Western Grebe	<i>Aechmophorus occidentalis</i>
<b>Shearwaters, Petrels</b>	
Wilson's Storm-petrel	<i>Oceanites oceanicus</i>
Cory's Shearwater	<i>Calonectris diomedea</i>
Greater Shearwater	<i>Puffinus gravis</i>
Sooty Shearwater	<i>Puffinus griseus</i>
Manx Shearwater	<i>Puffinus puffinus</i>
Audubon's Shearwater	<i>Puffinus lherminieri</i>
<b>Tropicbirds</b>	
White-tailed Tropicbird	<i>Phaeton lepturus</i>
<b>Boobies and Gannets</b>	
Masked Booby	<i>Sula dactylatra</i>
Brown Booby	<i>Sula leucogaster</i>
Northern Gannet	<i>Morus bassanus</i>
<b>Pelicans and their allies</b>	
American White Pelican	<i>Pelecanus erythrorhynchos</i>
•Brown Pelican	<i>Pelecanus occidentalis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Neotropic (Olivaceous) Cormorant	<i>Phalacrocorax brasilianus</i>
Great Cormorant	<i>Phalacrocorax carbo</i>
Anhinga	<i>Anhinga anhinga</i>
Magnificent Frigatebird	<i>Fregata magnificens</i>
<b>Hérons, egrets and allies</b>	
American Bittern	<i>Botaurus lentiginosus</i>
Least Bittern	<i>Ixobrychus exilis</i>

Common Name	Scientific Name
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Casmerodius albus</i>
Snowy Egret	<i>Egretta thula</i>
Little Blue Heron	<i>Egretta caerulea</i>
Tricolored Heron	<i>Egretta tricolor</i>
Reddish Egret	<i>Egretta rufescens</i>
Cattle Egret	<i>Bubulcus ibis</i>
Green-backed Heron	<i>Butorides striatus</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
Yellow-crowned Night-Heron	<i>Nyctanassa violaceau</i>
<b>Ibises, Spoonbill, Stork</b>	
Glossy Ibis	<i>Plegadis falcinellus</i>
White Ibis	<i>Eudocimus albus</i>
White-faced Ibis	<i>Plegadis chihi</i>
Roseate Spoonbill	<i>Ajaia ajaja</i>
Wood Stork	<i>Mycteria americana</i>
<b>Waterfowl</b>	
Fulvous Whistling-Duck	<i>Dendrocygna bicolor</i>
Tundra Swan	<i>Cygnus columbianus</i>
White-fronted Goose	<i>Anser albifrons</i>
Snow Goose	<i>Chen caerulescans</i>
Ross' Goose	<i>Chen rossii</i>
Brant Goose	<i>Branta bernicla</i>
Canada Goose	<i>Branta canadensis</i>
Wood Duck	<i>Aix sponsa</i>
Green-winged Teal	<i>Anas crecca</i>
American Black Duck	<i>Anas rubripes</i>
•Mottled Duck	<i>Anas fulvigula</i>
•Mallard	<i>Anas platyrhynchos</i>
White-cheeked Pintail	<i>Anas bahamensis</i>
Northern Pintail	<i>Anas acuta</i>
Blue-winged Teal	<i>Anas discors</i>
Northern Shoveler	<i>Anas clypeata</i>
Gadwall	<i>Anas strepera</i>
American Wigeon	<i>Anas americana</i>
Canvasback	<i>Aythya valisineria</i>
Redhead	<i>Aythya americana</i>
Ring-necked Duck	<i>Aythya collaris</i>
Greater Scaup	<i>Aythya marila</i>
Lesser Scaup	<i>Aythya affinis</i>

Common Name	Scientific Name
Harlequin Duck	<i>Histrionicus histrionicus</i>
Oldsquaw	<i>Clangula hyemalis</i>
Black Scoter	<i>Melanitta nigra</i>
Surf Scoter	<i>Melanitta perspicillata</i>
White-winged Scoter	<i>Melanitta fusca</i>
Common Goldeneye	<i>Bucephala clangula</i>
Bufflehead	<i>Bucephala albeola</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Common Merganser	<i>Mergus merganser</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
<b>Vultures, Hawks and Allies</b>	
Black Vulture	<i>Coragypus atratus</i>
Turkey Vulture	<i>Cathartes aura</i>
Osprey	<i>Pandion haliaetus</i>
American Swallow-tailed Kite	<i>Elanoides forficatus</i>
Black-shouldered Kite	<i>Elanus caeruleus</i>
Mississippi Kite	<i>Ictinia mississippiensis</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Northern Harrier	<i>Circus cyaneus</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Broad-winged Hawk	<i>Buteo platypterus</i>
Short-tailed Hawk	<i>Buteo brachyurus</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Rough-legged Hawk	<i>Buteo lagopus</i>
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine Falcon	<i>Falco peregrinus</i>
<b>Gallinaceous Birds (Quail, Turkey and Allies)</b>	
Wild Turkey	<i>Meleagris gallopavo</i>
Northern Bobwhite	<i>Colinus virginianus</i>
<b>Rails, Gallinules, Coots and Cranes</b>	
Yellow Rail	<i>Coturnicops noveboracensis</i>
Black Rail	<i>Laterallus jamaicensis</i>
Clapper Rail	<i>Rallus longirostris</i>

Common Name	Scientific Name
King Rail	<i>Rallus elegans</i>
Virginia Rail	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
Purple Gallinule	<i>Porphyryla martinica</i>
Common Moorhen	<i>Gallinula chloropus</i>
American Coot	<i>Fulica americana</i>
Sandhill Crane	<i>Grus canadensis</i>
<b>Shorebirds</b>	
Black-bellied Plover	<i>Pluvialis squatarola</i>
Lesser Golden-Plover	<i>Pluvialis dominica</i>
Snowy Plover	<i>Charadrius alexandrinus</i>
Wilson's Plover	<i>Charadrius wilsonia</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Piping Plover	<i>Charadrius melodus</i>
Killdeer	<i>Charadrius vociferus</i>
Mountain Plover	<i>Charadrius montanus</i>
American Oystercatcher	<i>Haematopus palliatus</i>
Black-necked Stilt	<i>Himantopus mexicanus</i>
American Avocet	<i>Recurvirostra americana</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Upland Sandpiper	<i>Bartramia longicauda</i>
Whimbrel	<i>Numenius phaeopus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Hudsonian Godwit	<i>Limosa haemastica</i>
Marbled Godwit	<i>Limosa fedoa</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Red Knot	<i>Calidris canutus</i>
Sanderling	<i>Caladris alba</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
Western Sandpiper	<i>Calidris mauri</i>
Least Sandpiper	<i>Calidris minutilla</i>
White-rumped Sandpiper	<i>Calidris fuscicollis</i>
Baird's Sandpiper	<i>Calidris bairdii</i>
Pectoral Sandpiper	<i>Calidris acuminata</i>
Dunlin	<i>Calidrus tenuirostris</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>

Common Name	Scientific Name
Stilt Sandpiper	<i>Calidrus himantopus</i>
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
<b>Shorebirds</b>	
Common Snipe	<i>Gallinago gallinago</i>
American Woodcock	<i>Scolopax minor</i>
Wilson's Phalarope	<i>Phalaropus tricolor</i>
Red-necked Phalarope	<i>Phalaropus lobatus</i>
Red Phalarope	<i>Phalaropus fulicaria</i>
Pomarine Jaeger	<i>Stercorarius pomarinus</i>
Parasitic Jaeger	<i>Stercorarius parasiticus</i>
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Laughing Gull	<i>Larus atricilla</i>
Franklin's Gull	<i>Larus pipixcan</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Herring Gull	<i>Larus argentatus</i>
Iceland Gull	<i>Larus glaucoides</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>
Glaucous Gull	<i>Larus hyperboreus</i>
Greater Black-backed Gull	<i>Larus marinus</i>
Black-legged Kittiwake	<i>Rissa tridactyla</i>
Sabine's Gull	<i>Xema (Larus) sabini</i>
Little Gull	<i>Larus minutus</i>
Gull-billed Tern	<i>Sterna nilotica</i>
Caspian Tern	<i>Sterna caspia</i>
Royal Tern	<i>Sterna maxima</i>
Sandwich Tern	<i>Sterna sandvicensis</i>
Roseate Tern	<i>Sterna dougallii</i>
Common Tern	<i>Sterna hirundo</i>
Forster's Tern	<i>Sterna forsteri</i>
Least Tern	<i>Sterna antillarum</i>
Bridled Tern	<i>Sterna anaethetus</i>
Sooty Tern	<i>Sterna fuscata</i>
Black Tern	<i>Chlidonias niger</i>
Black Skimmer	<i>Rynchops niger</i>
Brown Noddy	<i>Anous stolidus</i>
<b>Pigeons, Doves</b>	
Rock Dove	<i>Columba livia</i>

Common Name	Scientific Name
Band-tailed Pigeon	<i>Columba fasciata</i>
White-winged Dove	<i>Zenaida asiatica</i>
Mourning Dove	<i>Zenaida macroura</i>
Common Ground-Dove	<i>Columbina passerina</i>
Eurasian Collared Dove	<i>Streptopelia decaocto</i>
Ringed Turtle Dove	<i>Streptopelia risoria</i>
<b>Cuckoos</b>	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Groove-billed Ani	<i>Crotophaga sulcirostris</i>
<b>Owls</b>	
Barn Owl	<i>Tyto alba</i>
Eastern Screech-Owl	<i>Otus asio</i>
Great Horned Owl	<i>Bubo virginianus</i>
Snowy Owl	<i>Nyctea scandiaca</i>
Burrowing Owl	<i>Athene cunicularia</i>
Barred Owl	<i>Strix varia</i>
Long-eared Owl	<i>Asio otus</i>
Short-eared Owl	<i>Asio flammeus</i>
<b>Goatsuckers</b>	
Lesser Nighthawk	<i>Chordeiles acutipennis</i>
Common Nighthawk	<i>Chordeiles minor</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
<b>Swifts, Hummingbirds</b>	
Chimney Swift	<i>Chaetura pelagica</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
Black-chinned Hummingbird	<i>Archilochus alexandri</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
<b>Kingfishers</b>	
Belted Kingfisher	<i>Ceryle alcyon</i>
<b>Woodpeckers</b>	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus ruber</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Red-cockaded Woodpecker	<i>Picoides borealis</i>
Northern Flicker	<i>Colaptes auratus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>

Common Name	Scientific Name
<b>Flycatchers</b>	
Olive-sided Flycatcher	<i>Contopus borealis</i>
Eastern Wood-Pewee	<i>Contopus virens</i>
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>
Acadian Flycatcher	<i>Empidonax virescens</i>
Alder Flycatcher	<i>Empidonax alnorum</i>
Willow Flycatcher	<i>Empidonax traillii</i>
Least Flycatcher	<i>Empidonax minimus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Say's Phoebe	<i>Sayornis saya</i>
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Sulphur-bellied Flycatcher	<i>Myiodynastes luteiventris</i>
Tropical/Couch's Kingbird	<i>Tyrannus melancholicus/couchii</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Gray Kingbird	<i>Tyrannus dominicensis</i>
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>
Fork-tailed Flycatcher	<i>Tyrannus dominicensis</i>
<b>Martins and Swallows</b>	
Purple Martin	<i>Progne subis</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Bank Swallow	<i>Riparia riparia</i>
Cliff Swallow	<i>Hirundo pyrrhonota</i>
Cave Swallow	<i>Petrochelidon fulva</i>
Barn Swallow	<i>Hirundo rustica</i>
<b>Jays and Crows</b>	
Blue Jay	<i>Cyanocitta cristata</i>
American Crow	<i>Corvus brachyrhynchos</i>
Fish Crow	<i>Corvus ossifragus</i>
<b>Chickadees and Titmice</b>	
Carolina Chickadee	<i>Parus carolinensis</i>
Tufted Titmouse	<i>Parus bicolor</i>
<b>Nuthatches</b>	
Red-breasted Nuthatch	<i>Sitta canadensis</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Brown-headed Nuthatch	<i>Sitta pusilla</i>
<b>Creepers</b>	

Common Name	Scientific Name
Brown Creeper	<i>Certhia americana</i>
<b>Wrens</b>	
Rock Wren	<i>Salpinctes obsoletus</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
House Wren	<i>Troglodytes aedon</i>
Winter Wren	<i>Troglodytes troglodytes</i>
Sedge Wren	<i>Cistothorus platensis</i>
Marsh Wren	<i>Cistothorus palustris</i>
<b>Kinglets and Gnatcatchers</b>	
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>
<b>Bluebirds, Thrushes and Robin</b>	
Northern Wheatear	<i>Oenanthe oenanthe</i>
Eastern Bluebird	<i>Sialia sialis</i>
Veery	<i>Catharus fuscescens</i>
Gray-cheeked Thrush	<i>Catharus minimus</i>
Bicknell's Thrush	<i>Catharus minimus</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Hermit Thrush	<i>Catharus guttatus</i>
Wood Thrush	<i>Hylocichla mustelina</i>
American Robin	<i>Turdus migratorius</i>
<b>Thrashers</b>	
Gray Catbird	<i>Dumetella carolinensis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Sage Thrasher	<i>Oreoscoptes montanus</i>
Brown Thrasher	<i>Toxostoma rufum</i>
<b>Pipits</b>	
American Pipit	<i>Anthus rubescens</i>
Sprague's Pipit	<i>Anthus spragueii</i>
<b>Waxwings</b>	
Cedar Waxwing	<i>Bombycilla garrulus</i>
<b>Starling</b>	
European Starling	<i>Sternus vulgaris</i>
<b>Shrike</b>	
Loggerhead Shrike	<i>Lanius ludovicianus</i>
<b>Vireos</b>	
White-eyed Vireo	<i>Vireo atricapillus</i>

Common Name	Scientific Name
Bell's Vireo	<i>Vireo bellii</i>
Blue-Headed Vireo	<i>Vireo solitarius</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>
Warbling Vireo	<i>Vireo gilvus</i>
Philadelphia Vireo	<i>Vireo philadelphicus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Black-whiskered Vireo	<i>Vireo altiloquus</i>
Yellow-Green Vireo	<i>Vireo flavoviridis</i>
<b>Warblers</b>	
Bachman's Warbler	<i>Vermivora bachmanii</i>
Blue-winged Warbler	<i>Vermivora pinus</i>
Golden-winged Warbler	<i>Vermivora chrysoptera</i>
Tennessee Warbler	<i>Vermivora peregrina</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
Nashville Warbler	<i>Vermivora ruficapilla</i>
Northern Parula	<i>Parula americana</i>
Yellow Warbler	<i>Dendroica petechia</i>
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Magnolia Warbler	<i>Dendroica magnolia</i>
Cape May Warbler	<i>Dendroica tigrina</i>
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Yellow-rumped Warbler	<i>Dendroica coronata</i>
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Blackburnian Warbler	<i>Dendroica fusca</i>
Yellow-throated Warbler	<i>Dendroica dominica</i>
Pine Warbler	<i>Dendroica pinus</i>
Prairie Warbler	<i>Dendroica discolor</i>
Palm Warbler	<i>Dendroica palmarum</i>
Bay-breasted Warbler	<i>Dendroica castanae</i>
Blackpoll Warbler	<i>Dendroica striata</i>
Cerulean Warbler	<i>Dendroica cerulea</i>
Black-and-white Warbler	<i>Mniotilta vari</i>
American Redstart	<i>Setophaga ruticilla</i>
Prothonotary Warbler	<i>Protonotaria citrea</i>
Worm-eating Warbler	<i>Helmitheros vernivorus</i>
Swainson's Warbler	<i>Limnothlypis swainsonii</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Northern Waterthrush	<i>Seiurus noveboracensis</i>
Louisiana Waterthrush	<i>Seiurus motacilla</i>

Common Name	Scientific Name
Kentucky Warbler	<i>Oporornis formosus</i>
Connecticut Warbler	<i>Oporornis agilis</i>
Mourning Warbler	<i>Oporornis philadelphia</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Hooded Warbler	<i>Wilsonia citrina</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Canada Warbler	<i>Wilsonia canadensis</i>
Yellow-breasted Chat	<i>Icteria virens</i>
<b>Tanagers</b>	
Summer Tanager	<i>Piranga rubra</i>
Scarlet Tanager	<i>Piranga olivacea</i>
Western Tanager	<i>Piranga ludoviciana</i>
<b>New World Finches</b>	
Northern Cardinal	<i>Cardinalis cardinalis</i>
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Blue Grosbeak	<i>Guiraca caerulea</i>
Indigo Bunting	<i>Passerina cyanea</i>
Painted Bunting	<i>Passerina ciris</i>
Dickcissel	<i>Spiza americana</i>
<b>Sparrows</b>	
Green-tailed Towhee	<i>Pipilo chlorurus</i>
Eastern (Rufous-sided) Towhee	<i>Pipilo erythrophthalmus</i>
Bachman's Sparrow	<i>Aimophila aestivalis</i>
American Tree Sparrow	<i>Spizella arborea</i>
Chipping Sparrow	<i>Spizella passerina</i>
Clay-colored Sparrow	<i>Spizella pallida</i>
Field Sparrow	<i>Spizella pusilla</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Lark Bunting	<i>Calamospiza melanocorys</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Henslow's Sparrow	<i>Ammodramus henslowii</i>
Le Conte's Sparrow	<i>Ammodramus leconteii</i>
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>
Seaside Sparrow	<i>Ammodramus maritimus</i>
Fox Sparrow	<i>Passerella iliaca</i>
Song Sparrow	<i>Melospiza melodia</i>
Lincoln's Sparrow	<i>Melospiza lincolnii</i>

Common Name	Scientific Name
Swamp Sparrow	<i>Melospiza georgiana</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Harris' Sparrow	<i>Zonotrichia querula</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Lapland Longspur	<i>Calcarius lapponicus</i>
Smith's Longspur	<i>Calcarius pictus</i>
<b>Blackbirds, Grackles, Cowbirds and Orioles</b>	
Bobolink	<i>Dolichonyx oryzivorus</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
Rusty Blackbird	<i>Euphagus carolinus</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Boat-tailed Grackle	<i>Quiscalus major</i>
Common Grackle	<i>Quiscalus quiscula</i>
Bronzed Cowbird	<i>Molothrus aeneus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Orchard Oriole	<i>Icterus spurius</i>
Baltimore/Bullock's Oriole	<i>Icterus galbula/bullockii</i>
<b>Old World Finches</b>	
Purple Finch	<i>Carpodacus purpureus</i>
Pine Siskin	<i>Carduelis pinus</i>
American Goldfinch	<i>Carduelis tristis</i>
Evening Grosbeak	<i>Coccothraustes vespertinus</i>
<b>Weaver Finches</b>	
House Sparrow	<i>Passer domesticus</i>
<b>MAMMALS</b>	
White-tailed deer	<i>Odocoileus virginianus</i>
Coyote	<i>Canis latrans</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Red fox	<i>Vulpes vulpes</i>
Bobcat	<i>Felis rufus</i>
Feral hog	<i>Sus scrofa</i>
Raccoon	<i>Procyon lotor</i>
River otter	<i>Lutra Canadensis</i>
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Southern flying squirrel	<i>Glaucomys volans</i>

Common Name	Scientific Name
Marsh rabbit	<i>Sylvilagus aquaticus</i>
Marsh rice rat	<i>Oryzomys palustris</i>
Virginia opossum	<i>Didelphis virginiana</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern mole	<i>Scalopus aquaticus</i>
Florida woodrat	<i>Neotoma floridana</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Alabama beach mouse	<i>Peromyscus polionotus ammobaeetes</i>
House mouse	<i>Mus musculus</i>
<b>REPTILES</b>	
<b>Sea turtles</b>	
Loggerhead sea turtle	<i>Caretta caretta</i>
Green turtle	<i>Chelonia mydas</i>
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>
<b>Freshwater and terrestrial turtles</b>	
Northern diamond-backed terrapin	<i>Malaclemys terrapin</i>
Alligator snapping turtle	<i>Macrolemys temminckii</i>
Yellow-bellied slider	<i>Trachemys scripta</i>
Florida softshell turtle	<i>Apalone ferox</i>
Eastern box turtle	<i>Terrapene carolina</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
<b>Lizards</b>	
Green anole	<i>Anolis carolinensis</i>
Eastern fence lizard	<i>Sceloporus undulates</i>
Eastern glass lizard	<i>Ophisaurus ventralis</i>
Six-lined racerunner	<i>Cnemidophorus sexlineatus</i>
Broad-headed skink	<i>Eumeces laticeps</i>
Five-lined skink	<i>Eumeces fasciatus</i>
<b>Snakes</b>	
Black racer	<i>Coluber constrictor</i>
Gray rat snake	<i>Elaphe obsoleta spiloides</i>
Eastern ribbon snake	<i>Thamnophis sauritus</i>
Southern copperhead	<i>Agkistrodon contortrix</i>
Eastern coachwhip	<i>Masticophis flagellum</i>
Florida pine snake	<i>Pituophis melanoleucus</i>
Corn snake	<i>Elaphe guttata</i>
Southern ringneck snake	<i>Diadophis punctatus</i>
Eastern Indigo snake	<i>Drymarchon corais</i>

Common Name	Scientific Name
Water snake	<i>Nerodia sp.</i>
Cottonmouth	<i>Agkistrodon contortrix</i>
Pygmy rattlesnake	<i>Sistrurus miliarius</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>
Timber rattlesnake	<i>Crotalus horridus</i>
<b>AMPHIBIANS</b>	
American bullfrog	<i>Rana catesbeiana</i>
Southern leopard frog	<i>Rana sphenoccephala utricularius</i>
Southern toad	<i>Bufo terrestris</i>
Fowler's toad	<i>Bufo woodhousii fowleri</i>
Squirrel treefrog	<i>Hyla squirella</i>
Green treefrog	<i>Hyla cinerea</i>
Pig frog	<i>Rana grylio</i>
Spring peeper	<i>Pseudacris crucifer</i>

#### BEACH VEGETATION

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
Three-seeded mercury	<i>Acalypha gracilens</i>		353	SWX
Gerardia	<i>Agalinis purpurea</i>	551	486	SX
	<i>A. maritima</i>		485	W
Alligator weed	<i>Alternanthera philoxeroides</i>	236	242	W
Ragweed	<i>Ambrosia artemisifolia</i>		287	X
Devils walkingstick	<i>Aralia spinosa</i>		247	X
Red chokeberry	<i>Aronia arbutifolia</i>	518	467	X
Sandhill milkweed	<i>Asclepias humistrata</i>		251	DSX
Yellow foxglove	<i>Aureolaria flava</i>		486	X
Groundsel, Silverling	<i>Baccharis halimifolia</i>	284	295	BSWX
Water hyssop	<i>Bacopa innominata</i>	553	487	W
Narrow leaved balduina	<i>Balduina angustifolia</i>		295	DSX
Beggar tick	<i>Bidens mitis</i>	286	296	W
Sea rocket	<i>Cakile constricta</i>		340	B
Red basil	<i>Calamintha coccinea</i>		381	X
Beautyberry	<i>Callicarpa americana</i>		510	X
Deer Tongue, Vanilla plant	<i>Carphephorus odoratissimus</i>	294	297	X
Pignut hickory	<i>Carya glabra</i>		378	X
Partridge pea	<i>Cassia fasciculata</i>		399	SX

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
Dune sandspur	<i>Cenchrus tribuloides</i>		128	D
Centella	<i>Centella asiatica</i>	243	504	BW
Butterfly pea	<i>Centrosema virginianum</i>		400	BWX
Buttonbush	<i>Cephalanthus occidentalis</i>	524	472	BW
Seaside rosemary	<i>Ceratiola ericoides</i>		346	DSW
Atlantic white cedar	<i>Chamaecyparis thyoides</i>	20	54	X
Sand-dune spurge	<i>Chamaesyce ammannioides</i>		354	D
Bush goldenrod	<i>Chrysoma pauciflosculosa</i>		298	DSX
Golden aster	<i>Chrysopsis godfreyi</i> f. <i>godfreyi</i>		300	DSX
Sawgrass	<i>Cladium jamaicense</i>	53	84	W
Reindeer moss, Reindeer lichen	<i>Cladonia rangifera</i>			DSX
British soldier	<i>C. cristella</i>			DSX
Butterfly pea	<i>Clitoria mariana</i>		400	X
Day flower	<i>Commelina communis</i>		71	X
Rosemary	<i>Conradina canescens</i>		382	SX
Horseweed	<i>Conyza canadensis</i>		302	X
Silver-leaf croton	<i>Croton punctatus</i>		356	X
Love vine, Dodder	<i>Cuscuta</i> sp.		332	DBSWX
Sand vine	<i>Cynanchum angustifolium</i>		251	DSX
Titi	<i>Cyrilla racemiflora</i>	376	345	W
Beggar lice	<i>Desmodium</i> sp.		405	X
Buttonweed	<i>Dioda virginiana</i>	379	472	WX
Poor Joe	<i>D. teres</i>			BSWX
Persimmon	<i>Diospyros virginiana</i>	379	346	X
Fireweed	<i>Erechtites hieracifolia</i>	305	305	WX
Centipede grass	<i>Eremochloa ophiuroides</i>		143	BSX
Hat pins	<i>Eriocaulon decanglare</i>	92	105	W
Coral bean	<i>Erythrina herbacea</i>		405	X
White thoroughwort	<i>Eupatorium album</i>		307	X
Dogfennel	<i>E. capillifolium</i>		308	X
	<i>E. mohrii</i>	309	308	B
Flat-topped goldenrod	<i>Euthamia minor</i>	311	308	DBSWX
Cottonweed	<i>Froelichia floridana</i>		243	DX
Dwarf huckleberry	<i>Gaylussacia dumosa</i>		348	X

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
Crane's bill	<i>Geranium carolina</i>		368	WX
Purple cudweed	<i>Gnaphalium purpureum</i>		310	B
Gratiola	<i>Gratiola hispida</i>	554	487	S
Scratch daisy	<i>Haplopappus divaricatus</i>		310	X
	<i>Hedyotis uniflora</i>		473	BDX
Rockrose	<i>Helianthemum arenicola</i>		272	DSX
Golden aster	<i>Heterotheca subaxillaris</i>		313	BDSX
Swamp mallow	<i>Hibiscus grandiflora</i>	467	428	W
Seaside pennywort	<i>Hydrocotyle bonariensis</i>	250	505	DBW
St. Peter's wort	<i>Hypericum cistifolium</i>	421	370	CS
St. Peter's wort	<i>H. crux-andreae</i>	421	371	SX
Pinweed	<i>H. gentianoides</i>	425	372	SX
St. John's wort	<i>H. reductum</i>	431	370	BSW
Sand holly	<i>Ilex ambigua</i>		247	X
Dahoon	<i>I. cassine</i>			W
Gallberry	<i>I. glabra</i>		262	WX
American holly	<i>I. opaca</i>		264	X
Yaupon	<i>I. vomitoria</i>		265	SWX
Cogongrass	<i>Imperata cylindrica</i>		146	X
Beach morning glory	<i>Ipomoea imperati</i>		334	D
Arrow-leaved morning glory	<i>I. sagittata</i>			WX
Seashore elder	<i>Iva imbricate</i>			D
Needlerush	<i>Juncus roemerianus</i>			W
Hairy wicky	<i>Kalmia hirsute</i>			X
Salt marsh mallow	<i>Kosteletzkya virginica</i>			W
Redfoot	<i>Lachnanthes caroliniana</i>			SW
Bog buttons	<i>Lachnocaulon engleri</i>	95	105	B
Pinweed	<i>Lechea sessilifolia</i>		273	SX
Blazing star	<i>Liatris secunda</i>		317	DSX
Gopher apple	<i>Licania michauxii</i>		271	DSX
Toadflax	<i>Linaria floridana</i>		488	SX
Yellow flax	<i>Linum medium</i>	455	422	B
Lobelia	<i>Lobelia sp.</i>	357	260	X
	<i>Ludwigia alata</i>		442	B

<b>Common Name</b>	<b>Scientific Name</b>	<b>Page Number*</b>	<b>Page Number**</b>	<b>Habitat Code***</b>
Seedbox	<i>L. alternifolia</i>			BSX
Hairy primrose willow	<i>L. pilosa</i>			BW
Fox-tail clubmoss	<i>Lycopodium alopecuriodes</i>	12	42	BW
Water horehound	<i>Lycopus americanus</i>	440	383	WX
Fetterbush	<i>Lyonia lucida</i>	388	350	SWX
Loosestrife	<i>Lythrum lineare</i>	463	426	WB
Southern magnolia	<i>Magnolia grandiflora</i>		427	SX
Sweet bay	<i>M. virginiana</i>	466		SWX
Climbing hempweed	<i>Mikania scandens</i>		318	BSWX
Wax myrtle	<i>Myrica cerifera</i>	481	434	BSWX
Parrot feather	<i>Myriophyllum sp.</i>		373	B
Water-lily	<i>Nymphaea odorata</i>		436	W
Black gum	<i>Nyssa biflora</i>	495	437	W
Seaside evening primrose	<i>Oenothera humifusa</i>		444	D
Cactus	<i>Opuntia humifusa</i>		258	SX
Cactus	<i>O. pusilla</i>			SX
Wild olive	<i>Osmanthus americanus</i>		440	X
Cinnamon fern	<i>Osmunda cinnamomea</i>	14	44	W
Royal fern	<i>O. regalis</i>	15		W
Ladies' wood sorrel	<i>Oxalis corniculata</i>		445	SX
Sourwood	<i>Oxydendron arboretum</i>		350	X
Square flower	<i>Paronychia erecta</i>		267	DB
Swamp redbay	<i>Persea palustris</i>	450	389	WX
Common reed	<i>Phragmites australis</i>	194	156	W
Cape weed, Frog fruit	<i>Phyla nodiflora</i>	579	511	W
Leaf-flower	<i>Phyllanthus urinaria</i>	395	358	SX
Pokeweed	<i>Phytolacca Americana</i>		447	D
Pieris	<i>Pieris phillyreifolia</i>	390	350	W
Slash pine	<i>Pinus elliotii</i>	21	55	BSWX
Sand pine	<i>P. clausa</i>		55	SX
Grass-leaved aster	<i>Pityopsis graminifolia</i>		319	SX
Camphor weed	<i>Pluchea rosea</i>	325	321	BX
Bog bachelor's buttons	<i>Polygala lutea</i>	509	453	WX
	<i>P. polygama or grandiflora</i>			X

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
	<i>P. ramosa or cymosa</i>	509		BW
Wireweed	<i>Polygonella gracilis</i>		454	DSX
Jointweed	<i>P. polygama</i>			DSX
Large-leaved jointweed	<i>P. macrophylla</i>			DSX
Dotted smartweed	<i>Polygonum punctatum</i>	513	456	W
Resurrection fern	<i>Polypodium polypodioides</i>		48	X
Polypremum	<i>Polypremum procumbens</i>		423	DS
Pickrelweed	<i>Pontederia cordata</i>	210	190	W
Pink purslane	<i>Portulaca pilosa</i>		458	S
Mermaid weed	<i>Proserpinaca pectinata</i>	414	374	W
Bracken	<i>Pteridium aquilinum</i>		48	X
Mock bishop's weed	<i>Ptilimnium capillaceum</i>	255	506	WX
False dandelion	<i>Pyrrhopappus carolinianus</i>		322	X
Scrub live oak	<i>Quercus geminate</i>		364	DSX
Laurel oak	<i>Q. laurifolia</i>	403		X
Turkey oak	<i>Q. laevis</i>			X
Myrtle oak	<i>Q. myrtifolia</i>			DSX
Live oak	<i>Q. virginiana</i>			X
Meadow beauty	<i>Rhexia cubensis</i>	472	431	B
Winged sumac	<i>Rhus copallina</i>		243	X
	<i>Richardia scabra</i>		475	BSX
Blackberry	<i>Rubus argutus</i>		471	X
Dewberry	<i>R. trivialis</i>			DSX
Marsh pink	<i>Sabatia brevifolia</i>	409	368	X
Marsh pink	<i>S. stellaris</i>	409		W
Arrowhead	<i>Sagittaria lancifolia</i>	34	67	W
Tallow tree	<i>Sapium sebiferum</i>	396	359	W
Lizard tail	<i>Saururus cernuus</i>	546	479	W
Sweet broom	<i>Scoparia dulcis</i>	359	490	X
Palmetto	<i>Serenoa repens</i>		189	DSX
Bladder-pod	<i>Sesbania vesicaria</i>		413	X
Sea purslane	<i>Sesuvium portulacastrum</i>	234	241	B
Seymeria	<i>Seymeria cassioides</i>	560	662	SX
Indian hemp	<i>Sida rhomifolia</i>		429	X

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
Blue-eyed grass	<i>Sisyrinchium atlanticum</i>	105	171	X
Yellow blue-eyed grass	<i>S. exile</i>			X
	<i>Smilax auriculata</i>		193	BWSX
Catbrier	<i>S. bona-nox</i>			X
Bamboo vine	<i>S. laurifolia</i>			X
Wild sarsaparilla	<i>S. pumila</i>			X
Goldenrods	<i>Solidago sp.</i>		324	X
Corkwood	<i>Stillingia aquatic</i>	398	359	W
	<i>Stipulicida setaca</i>		268	DS
Sand bean	<i>Strophostyles helvola</i>		413	DBX
Pond cypress	<i>Taxodium ascendens</i>		56	W
Wood sage	<i>Teucrium canadense</i>	447	388	X
Spanish moss	<i>Tillandsia usneoides</i>		70	X
Poison ivy	<i>Toxicodendron radicans</i>		244	WX
Spiderwort	<i>Tradescantia ohiensis</i>		72	X
Blue curls	<i>Trichostema dichotomum</i>		388	X
Venus'looking glass	<i>Triodanis perfoliata</i>		262	X
Cattail	<i>Typha latifolia</i>		195	W
Sea-oats	<i>Uniola paniculata</i>		166	D
Floating bladderwort	<i>Utricularia radiata</i>		421	W
Bladderwort	<i>U. sublata</i>	454		BW
Sparkleberry, Tree huckleberry	<i>Vaccinium arboretum</i>		351	X
Highbush blueberry	<i>V. corymbosum</i>	392		X
Mayberry	<i>V. elliotii</i>	393		X
Dwarf huckleberry	<i>V. myrsinites</i>		352	SX
Deerberry	<i>V. stamineum</i>			X
Muscadine	<i>Vitis rotundifolia</i>		516	BWSX
Yellow-eyed grass	<i>Xyris sp.</i>		198	BW
Beargrass	<i>Yucca flaccida</i>		65	X
Threawn	<i>Aristida sp.</i>	130	123	D
Broomsedge	<i>Andropogon sp.</i>	125	118	DBX
	<i>A. virginicus var. glaucus</i>			
Jointed flat sedge	<i>Cyperus haspan</i>	58	87	B
Flat sedge	<i>C. retorsus</i>	60	87	B

Common Name	Scientific Name	Page Number*	Page Number**	Habitat Code***
Watergrass	<i>Enchinocloa walterii</i>	139	139	B
Red lovegrass	<i>Eragrostis oxylepis</i>			DSX
Purple lovegrass	<i>E. spectabilis</i>	141	143	DSX
Saltmarsh fringerush	<i>Fimbristylis castanea</i>	68	94	B
Rush fuirena	<i>Fuirena scripoidea</i>	71	94	B
Big-headed juncos	<i>Juncus megacephalus</i>	106	174	B
Beachgrass	<i>Panicum amarum var. amarulum</i>		152	D
Beachgrass	<i>P. amarum var. ararum</i>		152	D
	<i>P. portoricense</i>		136	DX
	<i>P. sphaerocarpon</i>		136	D
Torpedo grass	<i>P. repens</i>		153	DB
Switchgrass	<i>P. virgatum</i>	176	153	D
Bluestem	<i>Schizachyrium maritimum</i>	198	159	D
Marsh hay	<i>Spartina patens</i>	203	162	B

\* Represents Pages in *Florida Wetland Plants* by J. D. Tobe, et al.

\*\* Represents Pages in *Guide to the Vascular Plants of the Florida Panhandle* by A. F. Clewell

\*\*\* D = Dunes, B = Beach swales, W = Wetlands, S = Scrub, X = Xeric woodlands, roadsides



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# Appendix VII. Compatibility Determinations

## COMPATIBILITY DETERMINATIONS FOR BON SECOUR NATIONAL WILDLIFE REFUGE

This set of compatibility determinations describes the wildlife-dependent and other uses included in the public use program under the preferred alternative (Alternative D), as described in the Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge. It determines the conditions under which each use is considered compatible with the purposes, vision, and goals of the refuge and the mission of the National Wildlife Refuge System.

Under the National Wildlife Refuge System Administration Act of 1966, the Refuge Recreation Act of 1962, the National Wildlife Refuge System Improvement Act of 1997, and agency policy, the Service may not permit recreational uses on a national wildlife refuge unless those uses are first determined to be compatible wildlife-dependent uses. The needs of fish, wildlife, and plant resources on national wildlife refuges come first. All public uses must be compatible with these resources. A use is compatible if it is determined that the activity does not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge. Furthermore, compatible activities, which depend on healthy fish and wildlife populations, will be recognized as priority public uses. The 1997 law established the priority public uses to be: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

**Refuge Uses:** The following uses were evaluated to determine their compatibility with the Refuge System mission and the purposes of the refuge: 1) wildlife observation, photography, and hiking; 2) swimming and beach use; 3) recreational fishing; 4) environmental education and interpretation; and 5) scientific research.

**Refuge Name:** Bon Secour National Wildlife Refuge.

**Establishing and Acquisition Authorities:** Fish and Wildlife Act 1956, Special Legislation, Endangered Species Act, Consolidated Farm and Rural Development Act.

**Refuge Purposes:** ■...to conserve (A) fish or wildlife which are listed as endangered species or threatened species....or (B) plants....• 16 U.S.C. 1534 (Endangered Species Act of 1973).

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

■...this habitat should be preserved to ensure the well-being of these [nationally endangered and threatened species, such as the brown pelican, bald eagle, and several species of sea turtles, as well as many more species identified by the state to be of special concern] and other species, to serve as a living laboratory for scientists and students to provide wildlife-oriented recreation for the public. • 94 Stat. 483, dated June 9, 1980 (Act to establish the Bon Secour National Wildlife Refuge).

■...to conserve an undisturbed beach dune ecosystem which includes a diversity of fish and wildlife, and their habitat. • 94 Stat. 484, dated June 9, 1980 (Act to establish the Bon Secour National Wildlife Refuge).

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■...for conservation purposes....• 7 U.S.C. 2002 (Consolidated Farm and Rural Development Act).

**National Wildlife Refuge System Mission:** The mission, 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.•

Compatibility determinations for each description listed were considered separately. For brevity, the preceding sections from ■Refuge Uses• through ■National Wildlife Refuge System Mission• are only written once within this Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge, they are part of each descriptive use and become part of that compatibility determination, if considered individually or outside of the plan.

### **Description of Uses:**

#### *Wildlife Observation and Photography*

Wildlife observation and photography represent two of the six legislated wildlife-dependent priority public uses of the National Wildlife Refuge System.

An estimated 100,000 people visit the refuge each year, and many of these visitors engage in wildlife observation and photography. Refer to the comprehensive conservation plan for specific recommendations related to new facilities and other public uses.

Primary areas for these uses include three trails (e.g., Pine Beach, Jeff Friend, and Gator Lake) and the beaches of the Perdue and Fort Morgan units. Habitats used include maritime forests, dunes, beaches, and marshes. Approximately 100 acres of the 7,000 acres of the refuge are used frequently by visitors.

The refuge is open seven days per week during daylight hours and these uses could occur anytime during these hours. Summer has the highest use of any season followed by winter. Most users park at the trailheads or the parking lot on Mobile Street. In addition, many visitors stop by the refuge office to obtain information and use the restroom facilities. Any improvements to infrastructure are described in the comprehensive conservation plan.

These uses are popular according to responses from a survey sent to the public as part of the comprehensive conservation planning process. Wildlife observation and photography were listed as two of the top five preferred activities on the refuge. Opportunities to engage in these activities exist at Gulf State Park (10 miles from the refuge), however, in Alabama, the intact dune ecosystem is particularly unique to Bon Secour National Wildlife Refuge.

**Availability of Resources:** Administrative costs are outlined in the comprehensive conservation plan. There are no significant additional administrative costs expected at this time. No special equipment, facilities, or improvements are necessary to support these activities. Trail and sign maintenance is expected to run approximately \$1,500 per year.

**Anticipated Impacts of Use:** At current levels of use, short-term impacts of these uses are not expected to be significant. Long-term effects of these uses are not expected to be significant unless there is a substantial increase in the number of visitors. There are no anticipated cumulative effects of these uses with current levels of visitors.

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**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part of the planning process. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** These uses will be allowed only during daylight hours. Some areas of the refuge may be closed if excessive disturbance to wildlife (e.g., nesting shorebirds) is documented.

**Justification:** Wildlife observation and photography are two of the six legislated high priority uses of the Refuge System. In addition, these uses are consistent with the purposes of the refuge as described in its establishing legislation including **to provide wildlife-oriented recreation for the public.** (Act to establish Bon Secour National Wildlife Refuge). At this time, the levels of visitation are not considered to have a significant impact on the resources of the refuge.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2020

**Description of Uses:**

*Hiking and Backpacking*

Hiking and backpacking can be considered as a supporting use of wildlife observation and photography, two of the six legislated wildlife-dependent priority public uses of the National Wildlife Refuge System.

An estimated 100,000 people visit the refuge each year, and many of these visitors engage in hiking (including walks on the beach). Refer to the comprehensive conservation plan for specific recommendations related to new facilities and other public uses.

Primary areas for this use include three trails (e.g., Pine Beach, Jeff Friend, and Gator Lake) and the beaches of the Perdue and Fort Morgan units. Habitats used include maritime forests, dunes, beaches, and marshes. Approximately 100 acres of the 7,000 acres of the refuge are used frequently by visitors.

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The refuge is open seven days per week during daylight hours and these uses could occur anytime during these hours. Summer has the highest use of any season followed by winter. Most users park at the trailheads or the parking lot on Mobile Street. In addition, many visitors stop by the refuge office to obtain information and use the restroom facilities. Any improvements to infrastructure are described in the comprehensive conservation plan.

This use is popular according to responses from a survey sent to the public as part of the comprehensive conservation planning process. Hiking was listed as one of the top five preferred activities on the refuge. Opportunities to engage in this activity exists at Gulf State Park (10 miles from the refuge), however, in Alabama, the intact dune ecosystem is particularly unique to Bon Secour National Wildlife Refuge.

**Availability of Resources:** Administrative costs are outlined in the comprehensive conservation plan. There are no significant additional administrative costs expected at this time. No special equipment, facilities, or improvements are necessary to support this activity. Trail and sign maintenance is expected to run approximately \$1,500 per year.

**Anticipated Impacts of Use:** At current levels of use, short-term impacts of these uses are not expected to be significant. Long-term effects of these uses are not expected to be significant unless there is a substantial increase in the number of visitors. There are no anticipated cumulative effects of this use with current levels of visitors.

**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part of the planning process. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** This use will be allowed only during daylight hours. Some areas of the refuge may be closed if excessive disturbance to wildlife (e.g., nesting shorebirds) is documented. Some users may wish to include their dogs in their hiking and backpacking activities however, dog use on the refuge is not allowed due to conflicts with resource and management objectives. One of these objectives is to identify, conserve, manage, enhance, and restore populations of native fish and wildlife species representative of coastal Alabama, with special emphasis on migratory birds and threatened and endangered species. Shorebirds, including endangered species such as least terns and piping plovers, are disturbed by dog use on the refuge. Dogs may also dig up nests of threatened and endangered sea turtles. Although the effect of dog use on the endangered Alabama beach mouse is unknown, it is considered incompatible as dogs dig in the dunes and burrow sites.

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**Justification:** Hiking and backpacking can be considered as a supporting use of wildlife observation and photography, two of the six legislated wildlife-dependent priority public uses of the National Wildlife Refuge System. In addition, this use is consistent with the purposes of the refuge as described in its establishing legislation including **to provide wildlife-oriented recreation for the public.** (Act to establish Bon Secour National Wildlife Refuge). At this time, the levels of visitation are not considered to have a significant impact on the resources of the refuge.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2015

### **Description of Uses:**

#### *Beach Use*

Beach use is a popular, historic use of the refuge. Approximately 100,000 people visit the refuge each year, and many of these users visit the beaches of the Perdue and Fort Morgan units. Some public activity may also occur in Little Lagoon, but this area is not frequently used. These habitats are used by threatened and endangered sea turtles and the endangered Alabama beach mouse.

Refuge beaches are open during daylight hours seven days per week, year-round. Primary use occurs during the summer months. Typically, visitors utilize the parking lot on Mobile Street to use the Perdue Unit beaches, or park along the beach access road in the Fort Morgan Unit to use those beaches.

Many other beaches are available to the public along the Alabama Gulf Coast, however, the refuge is unique by having undeveloped beaches with a relatively low density of people. Tourists and locals come to the refuge beaches to sun bath, hike, observe and photograph wildlife, and for a degree of solitude and tranquility that cannot be found on other Alabama beaches.

Refer to the comprehensive conservation plan for a description of infrastructure improvements or law enforcement issues related to beach use. Facilities necessary to support these uses are also detailed in the Final plan.

**Availability of Resources:** Costs of administration and management are outlined in the comprehensive conservation plan. Maintenance costs of signs, parking areas, and boardwalks are estimated at \$1,000 per year. Offsetting revenues, such as entrance fee proposals, are explained in the Final plan.

**Anticipated Impacts of the Use:** Short-term impacts of beach use could include disturbance of nesting shorebirds, Alabama beach mice, sea turtles, and/or other wildlife, as well as degradation of habitat. An excessive amount of garbage could result from use of refuge beaches, which could lead to wildlife injury.

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Long-term impacts of beach use could include reduction of shorebird nesting on refuge beaches. Beach use could result in cumulative losses of habitat, especially for nesting shorebirds, if the level of visitation significantly increases in the future.

**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part of the planning process. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Refuge beaches are closed after dark to protect sea turtles, Alabama beach mice, and shorebirds from disturbance. Some areas of the beach may be closed if significant disturbance of nesting shorebirds is documented. Some users may wish to include their dogs in their beach use activities however, dog use on the refuge is not allowed due to conflicts with resource and management objectives. One of these objectives is to identify, conserve, manage, enhance, and restore populations of native fish and wildlife species representative of coastal Alabama, with special emphasis on migratory birds and threatened and endangered species. Shorebirds, including endangered species such as least terns and piping plovers, are disturbed by dog use on the refuge. Dogs may also dig up nests of threatened and endangered sea turtles.

The dune walk-over on Mobile Street will be maintained to discourage visitors from walking on the dunes in beach mouse habitat and although the effects of dog use on the endangered Alabama beach mouse is unknown, it is considered incompatible as dogs dig in the dunes and burrow sites.

**Justification:** Beach use is an existing, historic use of the refuge. This activity does not currently conflict with wildlife-dependent priority public uses. Refuge signs and management activities (e.g., sea turtle nest markers) may educate a constituency of the public about wildlife issues that otherwise would not be exposed to these issues if the beaches were closed. For example, beach visitors frequently approach staff and volunteers to ask questions when a sea turtle nest is being marked or excavated.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2015

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**Description of Use:***Recreational Fishing*

Recreational fishing is one of the six legislated wildlife-dependent priority public uses of the National Wildlife Refuge System. An estimated 2,000 anglers per year visit Bon Secour Refuge to participate in either saltwater or freshwater fishing.

Most fishing occurs from the shoreline on the Perdue and Fort Morgan units. Some fishing occurs in Bon Secour and Mobile bays along the Sand Bayou, Little Point Clear, and Little Dauphin Island units, although access is limited. Gator Lake and Little Lagoon, located in the interior of the Perdue Unit, are also used by anglers.

Few improvements are proposed as part of the preferred alternative. The Fort Morgan beach access road and Mobile Street are the two main access points for shoreline anglers. Boaters access the refuge from public boat launches located off-refuge. The public accesses Gator Lake and Little Lagoon by pulling a canoe trailer on foot from the Pine Beach trailhead and using a non-motorized boat or an electric trolling motor. All other fishing access to the refuge is either by foot or by anchoring a boat in a public waterway, such as the Gulf of Mexico or Bon Secour Bay, and then accessing the refuge on foot.

Fishing is a year-round activity on Bon Secour Refuge. It occurs seven days per week only during daylight hours, with the exception of night fishing on the Fort Morgan Unit. Night fishing is regulated under a special permit that is awarded by a drawing that limits the number of anglers and defines the season when the use is allowed.

Fishing is wildlife-dependent and very popular on the refuge. Gator Lake is one of only two freshwater lakes on the immediate Alabama Gulf Coast. The Fort Morgan Unit is well known regionally as a top fishing spot, especially for redfish. Although other saltwater fishing opportunities exist in the area, waters accessible by the refuge are known by locals as supporting some of the best fishing in this part of the state.

**Availability of Resources:** Administrative expenses including law enforcement expenses are outlined in the comprehensive conservation plan. Maintenance costs of trails and signs are expected to be approximately \$1,500 per year. No monitoring costs of fish populations are expected, since fisheries data for nearly all of the affected areas should be available from other federal and state agencies. A permit fee to cover administrative costs of the special night fishing season will be collected.

**Anticipated Impacts of Use:** Some short-term disturbance to shorebirds and other wildlife is expected. Potential long-term impacts would include the loss of nesting habitat due to disturbance of shorebirds in areas of the beach where the highest use occurs (e.g., Fort Morgan Unit). The fishing program is not expected to have substantial cumulative effects on resources. Should the level of use become much greater in the future, the impacts would have to be re-evaluated and the use altered to limit those impacts.

**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part of the planning process. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

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**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Any areas where shorebirds are determined to be excessively disturbed, especially during nesting season, will be closed to fishing. Access to Gator Lake will continue to be on foot and only non-motorized boats or boats with electric trolling motors will be allowed on the lake. Motorized boat access to the refuge from Little Lagoon, the Gulf of Mexico, Bon Secour Bay, and Mobile Bay would have to be from public boat launches off-refuge. Night fishing will only occur during a specified season that will not interfere with the sea turtle nesting and hatching season. The Fort Morgan Unit is the only location where night fishing will be allowed during this season.

**Justification:** Recreational fishing and its associated boating uses are consistent with the purposes of the refuge, as described in its establishing legislation to provide wildlife-dependent recreation for the public (Act to establish Bon Secour National Wildlife Refuge). This use is one of the preferred activities by the public, according to comments received during the comprehensive conservation planning process.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2020

**Description of Uses:**

*Environmental Education and Interpretation*

Environmental education and interpretation are existing uses on Bon Secour National Wildlife Refuge. These uses are two of the six legislated wildlife-dependent, priority public uses of the National Wildlife Refuge System. Each year the refuge hosts 10-20 groups involved with one of these two uses for a total of about 600 users. Additionally, approximately 100,000 people visit the refuge each year, many of whom walk at least one of the three nature trails.

Environmental education and interpretation primarily occur on refuge trails including Pine Beach, Jeff Friend, and Gator Lake. Additionally, the Centennial Trail is currently under construction on the Perdue Unit. These programs take place in a variety of habitats, including maritime forests, dunes, and beaches. In the dune ecosystem, endangered Alabama beach mice use the areas where these programs occur, however, beach mice are nocturnal (U.S. Fish and Wildlife Service 1987) and most of these programs only occur during daylight hours. If night programs are initiated (e.g., herp walks), then participants will only be allowed in areas that are not beach mouse habitat as determined by refuge staff. In addition, damage to habitat will be minimal, since participants are rarely led off of a trail during a program.

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These uses occur on approximately 100 acres of the refuge, including the trails and immediately adjacent lands. Parking is located at each trailhead, except for the Gator Lake trail, where users typically park along the edge of Mobile Street.

Each year, approximately 600 visitors are led on educational or interpretive walks on the refuge, either by refuge staff or volunteers. Some refuge equipment, such as binoculars, may be provided during tours but more typically visitors will provide their own.

The refuge contains an intact dune ecosystem, which has nearly disappeared from the rapidly developing Alabama Gulf Coast. The associated habitats, along with the maritime forest on the refuge, are unique to this area, so similar opportunities do not exist near the refuge. Other opportunities in different habitats, such as upland pine woods, are available at nearby Gulf State Park and other public lands.

**Availability of Resources:** The comprehensive conservation plan contains estimates of costs for refuge administration and management. Environmental education materials cost an estimated \$5,000 per year. The refuge has adequate resources to fund these programs. Maintenance costs are estimated to be \$1,000 per year for the currently existing trails. No user fees are in effect at this time. User fees may be collected in the future, however, this is more likely to occur near beach access points than at trailheads.

**Anticipated Impacts of Uses:** Environmental education and interpretation are consistent with the purposes of the Refuge System and Bon Secour Refuge. The impact of these activities on wildlife is minimized through the use of refuge trails and the enforcement of day-use only policies of the refuge, with the exception of some guided night tours by refuge or volunteer staff. No significant resources should be diverted from other activities, since most of these tours are conducted by refuge volunteers. When the refuge staff conducts tours, the time is well spent since these programs are identified as high priority wildlife-dependent uses.

These uses will not have significant direct or indirect long-term impacts on wildlife and habitat at current levels, as long as they occur on established trails, or only occasionally off trails.

If public use increases on the refuge, there would be a potential for a cumulative effect of these activities on wildlife and habitat. However, many of the surveys outlined in the comprehensive conservation plan (e.g., beach mouse and shorebird monitoring) would assist refuge staff in monitoring the effects of public use on these species.

**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part of the planning process for the refuge. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

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**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** No guided tours or other educational or interpretive uses will be allowed in the dunes at night to prevent disturbance of Alabama beach mice.

Identified nesting areas for shorebirds will be avoided during these uses.

**Justification:** Environmental education and interpretation are consistent with the purposes of the refuge as described in its establishing legislation including **to serve as a living laboratory for scientists and students and to provide wildlife-dependent recreation for the public** (Act to establish the Bon Secour National Wildlife Refuge). These uses are strongly supported by the public according to comments received during the comprehensive conservation planning process.

Literature and References: U.S. Fish and Wildlife Service. 1987. Recovery Plan for the Alabama Beach Mouse (*Peromyscus polionotus ammobates*). 45pp.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2020

**Description of Use:**

*Scientific Research*

Scientific research (including collecting and conducting surveys) is an existing use of the refuge. It is not one of the six legislated wildlife-dependent priority public uses of the National Wildlife Refuge System. However, this public use contributes to the staff's knowledge concerning flora and fauna of the refuge and often provides information that assists the habitat management program. Current research projects include: interior habitat modification for the Alabama beach mouse (Auburn University); neotropical migratory bird trapping and banding to determine habitat use, energetic condition, stop-over habits, temporal pattern of fall migration, disease occurrence (University of Southern Mississippi), and Christmas bird count.

Generally, these research projects or surveys involve approximately 10-20 workers per year and minimal staff time. Personnel typically stay in the refuge bunkhouse (except for Christmas bird count participants).

Research uses on the refuge can occur in any area. Currently, Alabama beach mouse research occurs on the Perdue and Fort Morgan units. The bird banding station is located on the northern portion of the Fort Morgan Unit. Two Christmas bird counts encompass at least some of all five refuge units. Most research takes place in dune or scrub habitat.

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Long-term research projects may occur year-round. Special surveys are usually one day in duration.

For beach mouse research, Fish and Wildlife Service equipment, such as a Gyrotrac, may be used to clear vegetation as agreed upon in research proposals and cooperative agreements. The University of Southern Mississippi provides all equipment for bird banding on the refuge. These projects involve approximately 10 workers per year.

The refuge contains the largest tract of contiguous Alabama beach mouse habitat, so similar areas for research are not available. For neotropical migratory bird research, the refuge is unique to the area with the large number of migratory birds that use the refuge and the facilities that are available (e.g., bunkhouse) to support researchers. Other surveys such as the Christmas bird count are large-scale projects where national coverage is the goal.

**Availability of Resources:** Administrative costs are outlined in the comprehensive conservation plan. Some maintenance of trails at the banding station is expected. These costs should not exceed \$200 per year. Most other costs are the responsibility of the user.

Researchers currently pay rent at the rate of \$10 per day for each worker to stay in the Nunley Bunkhouse on the refuge. This revenue helps to offset the cost of utilities and maintenance for the duration of the project.

**Anticipated Impacts of Use:** Scientific research is consistent with one of the establishing purposes of the refuge. As with every proposed research project, a Special Use Permit will be issued and a Section 7 Consultation (if appropriate) will be conducted. For threatened and endangered species, or species of concern or in decline, research designed to monitor, enhance, and sustain these populations will be emphasized. Habitat management projects with implications to enhance management on the refuge for particular species or suites of species will be encouraged. Scientific research is not expected to have cumulative impacts on resources and because each project is reviewed on an individual basis, will be controlled. Should requests to conduct research become overwhelming, higher emphasis will be granted to research related to threatened and endangered species and priority habitats, such as dunes and scrub lands. Finally, research for the sake of pure research, with no application to management practice, will be highly scrutinized and discouraged.

**Public Review and Comment:** The period of public review and comment began 02/01/2003, and ended 06/30/2003. Methods used to solicit public review and comment included a posted notice at refuge headquarters, a letter sent to adjacent landowners, a letter sent to other interested persons, two public meetings, and a questionnaire mailed as part the planning process. An additional 45-day comment period occurred when the draft comprehensive conservation plan was distributed to the public. Appendix IV summarizes the public comments.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Surveys, research, and collecting will be evaluated on a case-by-case basis through Section 7 consultations, special use permits, or other documents.

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**Justification:** Use of the refuge for scientific collection, surveys, and research is consistent with the purposes of the refuge as described in its establishing legislation including "...to serve as a living laboratory for scientists and students." (Act to establish the Bon Secour National Wildlife Refuge). Research activities provide important benefits to the refuge and its natural resources. Research can lead to better management decisions and has the potential to further the purposes of the refuge and the mission of the National Wildlife Refuge System.

**NEPA Compliance for Refuge Use Decision:** *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- or 15-Year Re-evaluation Date:** September 2015

**Approval of Compatibility Determination**

The signature of approval is for all compatibility determinations considered within the comprehensive conservation plan. If one of the described uses is considered for compatibility outside of the plan, the approval signature becomes part of that determination.

**Refuge Manager:**

//S// Robert A. Cail 6/15/05  
(Signature/Date)

**Regional Compatibility Coordinator:**

//S// Steve Johnson 26 Sep 2005  
(Signature/Date)

**Refuge Supervisor:**

//S// Richard P. Ingram 9/27/05  
(Signature/Date)

**Regional Chief, National Wildlife Refuge System, Southeast Region:**

//S// Jon Andrew 9-28-05  
(Signature/Date)

# Appendix VIII. Intra-Service Section 7 Biological Evaluation

- Marking and monitoring of sea turtle nests
- Monitoring of wintering piping plovers
- Monitoring of nesting least terns
- Trapping and monitoring of eastern indigo snakes
- Construction of dune walkovers on Bureau of Land Management tracts when they become part of the refuge

**V. Pertinent Species and Habitat:**

**A. Include species/habitat occurrence map:**

See Comprehensive Conservation Plan

**Complete the following table:**

SPECIES/CRITICAL HABITAT	STATUS <sup>1</sup>
Alabama beach mouse	E, CH
Least Tern	E
Piping Plover	E, PCH
Loggerhead Sea Turtle	T
Kemp's Ridley Sea Turtle	E
Green Sea Turtle	T
Eastern Indigo Snake	T

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

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

**A. Ecoregion Number and Name:** ETP-29 Central Gulf Ecosystem

**B. County and State:** Baldwin and Mobile Counties, Alabama

**C. Section, township, and range (or latitude and longitude):** Section 25, T9S, R2E, Section 23, T9S, R2E, and Section 26, T9S, R2E.

**D. Distance (miles) and direction to nearest town:** 8 miles to Gulf Shores.

**E. Species/habitat occurrence:**

Alabama beach mouse (beach/dunes); piping plover (beach/dunes); least tern (beach/dunes); loggerhead turtle (beach/dunes); Kemp's ridley turtle (beach/dunes); green turtle (beach/dunes); and eastern indigo snake (possible in all refuge habitats except open water).

**VII. Determination of Effects:**

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

<b>SPECIES/ CRITICAL HABITAT</b>	<b>IMPACTS TO SPECIES/CRITICAL HABITAT</b>
Alabama beach mouse	Optimizing public use and outreach should lead to increased support for conservation of Alabama beach mice; may result in higher levels of visitation and impact to the habitat; emphasis on wildlife and habitat in the plan should result in adaptive management that contributes to recovery of this endangered species.
Piping plover	Emphasis on wildlife and habitat management in the plan should result in greater protection of wintering plovers; some disturbance may occur.
Least tern	Emphasis on wildlife and habitat management in the plan should result in greater protection of nesting terns; some disturbance may occur.
Loggerhead sea turtle	Emphasis on wildlife and habitat management and outreach in the plan should lead to increased support for conservation of sea turtles (e.g. reduction in light pollution); some disturbance may occur.
Kemp's ridley sea turtle	Emphasis on wildlife and habitat management and outreach in the plan should lead to increased support for conservation of sea turtles (e.g. reduction in light pollution); some disturbance may occur.
Green sea turtle	Emphasis on wildlife and habitat management and outreach in the plan should lead to increased support for conservation of sea turtles (e.g. reduction in light pollution); some disturbance may occur.
Eastern indigo snake	Emphasis on wildlife and habitat management in the plan should increase conservation of this species through adaptive management; some disturbance may occur.

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

<b>SPECIES/ CRITICAL HABITAT</b>	<b>ACTIONS TO MITIGATE/MINIMIZE IMPACTS</b>
Alabama beach mouse	Construction of boardwalks and use of sand fencing to restrict access to dunes will minimize impacts of increased visitor use; hiring of a full-time law enforcement officer as requested in the plan will result in increased protection for this species; other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects.
Piping plover	Hiring of a full-time law enforcement officer as requested in the plan will result in increased protection for this species; use of spotting scopes to monitor from a distance and other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects.
Least tern	Hiring of a full-time law enforcement officer as requested in the plan will result in increased protection for this species; use of spotting scopes to monitor from a distance and other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects.
Loggerhead sea turtle	Restricting all-terrain vehicle use to near the shoreline and other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects; Hiring of a full-time law enforcement officer as requested in the plan will result in increased protection of nests.
Kemp's ridley sea turtle	Restricting all-terrain vehicle use to near the shoreline and other measures to minimize disturbance will be outlined in species-specific Section 7 evaluation form for individual projects; Hiring of a full-time law enforcement officer as requested in the plan will result in increased protection of nests.
Green sea turtle	Restricting all-terrain vehicle use to near the shoreline and other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects; Hiring of a full-time law enforcement officer as requested in the plan will result in increased protection of nests.
Eastern indigo snake	Following standard trapping protocol and other measures to minimize impacts of research and management will be outlined in separate Section 7 evaluations for individual projects.

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

SPECIES/ CRITICAL HABITAT	DETERMINATION <sup>1</sup>			RESPONSE <sup>1</sup> REQUESTED
	NE	NA	AA	
Alabama beach mouse		X		Concurrence
Piping plover	X			Concurrence
Least tern		X		Concurrence
Loggerhead, Kemp's Ridley, Green Turtles		X		Concurrence
Indigo snake	X			Concurrence

**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".

**//S// Jereme N. Phillips**

*Jereme N. Phillips*  
**Jereme N. Phillips, Acting Refuge Manager**  
 (originating station)

*26 May 2007*  
**Date**

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

A. Concurrence X Nonconcurrence \_\_\_\_\_

B. Formal consultation required \_\_\_\_\_

C. Conference required \_\_\_\_\_

D. Informal conference required \_\_\_\_\_

E. Remarks (attach additional pages as needed):

*Daphne ES*  
 \_\_\_\_\_  
 signature

*7-15-04*  
 \_\_\_\_\_  
 date

*Field Supervisor*  
 \_\_\_\_\_  
 title

*Daphne ES*  
 \_\_\_\_\_  
 office

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# *Appendix IX. Finding Of No-Significant Impact*

## **Bon Secour National Wildlife Refuge Comprehensive Conservation Plan Baldwin and Mobile Counties, Alabama**

### **Introduction**

The Fish and Wildlife Service proposes to protect and manage certain fish and wildlife resources in Baldwin County, Alabama, through the Bon Secour National Wildlife Refuge. An Environmental Assessment has been prepared to inform the public of the possible environmental consequences of implementing the Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge. 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.

### **Alternatives**

In developing the Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge, the Fish and Wildlife Service evaluated four alternatives: Alternatives 1, 2, 3, and 4.

The Service adopted Alternative 4, the “Preferred Alternative,” as the plan for guiding the direction of the refuge for the next 15 years. The overriding concern reflected in this plan 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 ( fishing, wildlife observation, wildlife photography, and environmental education and interpretation) will be emphasized and encouraged.

#### *Alternative 1. No Action Alternative*

Existing refuge management and public outreach practices would be favored under this alternative. All refuge management actions would be directed towards achieving the refuge’s primary purposes including (1) preserving habitat to ensure the well-being of nationally endangered and threatened species, (2) conserving an undisturbed beach/dune ecosystem which includes a diversity of fish, wildlife, and their habitats, and (3) serving as a living laboratory for scientists and students and providing wildlife-oriented recreation for the public. Refuge management programs would continue to be developed and implemented with little baseline biological information. Active habitat management would include beach/dune habitat improvement and restoration, protection of nesting sea turtles, and prescribed burning designed to reduce fuel loads. Land would be acquired from willing sellers within the current acquisition boundaries totaling 12,570 acres.

Fishing and wildlife observation would continue to be the major focus for the refuge public use program, with no expansion of current opportunities. Current restrictions or prohibitions would remain. No new trails would be developed, but the refuge staff would continue to maintain the existing trails. Environmental education, interpretation, and wildlife photography would be accommodated on a case-by-case basis. Plans would request funding to construct a maintenance facility and to rehabilitate existing facilities.

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### *Alternative 2.*

Under this alternative, the emphasis would be to improve refuge resources for wildlife, while still maintaining those public use opportunities which presently exist. Most refuge management actions would be directed towards preserving, enhancing, restoring, and managing the beach/dune habitat for the benefit of the Alabama beach mouse and nesting sea turtles and utilizing prescribed burning to improve habitat for neotropical migratory birds. Other national, regional, and state goals to protect and restore forest, grassland and scrub/shrub bird populations would be supported secondarily in habitats that are inland from the beach/dune habitat. Baseline data would be collected, standardized surveys implemented, and populations monitored.

Additional staff would include a biological technician and a law enforcement officer to accomplish objectives for establishing baseline data on refuge resources and managing habitats and to protect refuge biological resources.

Under this alternative, the refuge would continue to seek lands from willing sellers within the acquisition boundary. Non-traditional land protection methods would be developed and employed.

Public uses would include wildlife observation and photography, limited interpretation, and fishing. Under this alternative, outreach and environmental education would occur on a sporadic, time-permitting basis. No evaluation of existing uses would occur. Fishing and wildlife observation would continue to be the major focus for the refuge public use program, with no expansion or enhancement of current opportunities. No new trails would be developed, but the refuge staff would continue to maintain the existing trails. All new funding would support the wildlife and habitat management programs, with annual maintenance funding to support upkeep of existing public use facilities. Partnership opportunities would not be feasible, as the refuge staff's full attention would be on managing refuge lands and collecting biological information. This alternative in no way addresses the increase in visitation that has occurred in the past five years and that is predicted to continue.

### *Alternative 3.*

This approach would maintain the current wildlife and habitat management activities while allowing for significantly more public recreational uses. Additional staff needed to implement this alternative includes an outdoor recreation planner, a law enforcement officer, and a seasonal maintenance worker. Trails, parking lots, and interpretive signage would be constructed in every refuge unit, along with added environmental education and watchable wildlife programs. Additional staff would be used for developing and presenting both on and off-site outreach and interpretation programs. A user fee and permit system would be implemented for fishing and beach use.

A visitor center and headquarters office would be constructed on the refuge and would include environmental education classroom and meeting facilities.

Land acquisition within the current acquisition boundary would continue with emphasis on those lands that can provide additional public use opportunities and beach access.

Sporadic beach mouse live-trapping and monitoring of sea turtle nests on refuge beaches would continue. No new surveys on migratory songbirds and shorebirds, breeding songbirds, shorebirds and marshbirds, and wintering shorebirds would occur. Baseline data on herpetofauna would not be collected. Only dune restoration habitat projects would occur. Grassland and shrub/scrub habitat would not be restored and managed and prescribed fire would continue to focus on fuel reduction versus enhancing bird habitats. All new partnerships would be related to visitor services, public outreach and environmental education.

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#### *Alternative 4*

The Service planning team identified Alternative D as the preferred alternative. This Alternative was developed based on public input and the best judgment of the planning team. The strategies presented in the Draft CCP were developed as a direct result of the selection of Alternative D.

This preferred alternative will promote a greater understanding and protection of the fish, wildlife, and their habitats and a higher quality, balanced recreational opportunities for visitors. Fishing will continue with greater emphasis on the quality of the experience. Education and interpretation will be promoted with regular programs and partnerships with local schools. Wildlife observation and photography opportunities will be expanded, including a kayak trail and observation towers, highlighting refuge management programs and unique wildlife habitats. A user fee and permit will be implemented to facilitate night fishing at Mobile Point.

A visitor center and headquarters office will be constructed on the refuge, with space for interpretation, environmental education, and staff.

Research studies on the refuge will be fostered and partnerships developed with universities and other agencies, providing needed resources and experiment sites while meeting the needs of the refuge's wildlife and habitat management programs. Research will also benefit conservation efforts throughout the Central Gulf Coast to preserve, enhance, restore, and manage coastal barrier island habitat. New surveys on birds, reptiles, and amphibians will be initiated to develop baseline information.

Additional staff will include both biological and outreach personnel. A biological technician, outdoor recreation planner, seasonal maintenance worker, and full-time law enforcement officer will be added to accomplish objectives for establishing baseline data on refuge resources, managing habitats, providing opportunities and facilities for wildlife observation and photography, providing educational programs that promote a greater understanding of the refuge resources, and protecting natural and cultural resources and refuge visitors.

Under this alternative, the refuge will continue to seek acquisition of all lands within the present acquisition boundary. Lands acquired as part of the refuge will be made available for compatible wildlife-dependent public recreation and environmental education opportunities, where appropriate. Pristine lands that provide high, quality habitat and connectivity to existing refuge lands will be priority acquisitions. Equally important acquisition tools to be used include: transfer lands, partnerships with conservation organizations, conservation easements with adjacent landowners, and leases/cooperative agreements with state agencies.

#### **Selection Rationale**

Alternative 4 is selected for implementation because it directs the development of programs to best achieve the refuge purpose and goals; emphasizes the restoration of open wetland and forest habitats; 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 Alternatives 4, refuge management actions will expand wildlife and habitat programs and enhance public use by focusing on the quality of experiences instead of a quantity of programs and facilities. Critical habitat for the Alabama beach mouse will be improved and restored.

#### **Environmental Effects**

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Implementation of the Service's management action is expected to result in environmental, social, and economic effects as outlined in the comprehensive conservation plan. Habitat management, population management, land conservation, and visitor service management activities on Bon Secour National Wildlife Refuge will result in increased protection for threatened and endangered species; enhanced wildlife populations; beach/dune restoration; and enhanced opportunities for wildlife-dependent recreation and environmental education. These effects are detailed as follows:

1. Additional staff and resources will create and properly manage the diversity of habitats found on the refuge, including grasslands, shrub/scrub, wetlands, and pine/oak forests. Active management of these communities will likely result in greater species diversity and abundance of migratory birds. Baseline data will be collected on populations and habitats and monitoring protocols established. Invasive species will be controlled, which will have a positive effect on the biotic community. Additional funds and resources will be committed to ensure that sea turtle hatching success is increased along the entire Alabama coast. Public disturbance during shorebird nesting will be reduced and nesting success increased. A Hawk Watch site will be established and better information will be collected on raptors.
2. Quality wildlife-dependent recreational activities (e.g., fishing, wildlife observation, and interpretation) will continue and environmental education programs will be developed. Improved interpretive and informational programs will increase awareness of the refuge and wildlife and of the mission of the National Wildlife Refuge System. Quality fishing opportunities will be provided, consistent with sound biological principles.
3. Land will be acquired in an attempt to complete the current approved boundary of 12,570. New refuge lands of up to 10 percent of the current acquisition boundary could be acquired.
4. Cultural resources will be surveyed, documented, and protected refuge-wide. The current refuge office will be remodeled for biological staff and a new maintenance shop will be constructed.
5. Habitat restoration and management, along with a focus on accessibility and facility developments, will result in improved wildlife-dependent recreational opportunities. While public use will result in some minimal, short-term adverse effects on wildlife, and user conflicts may occur at certain times of the year, these effects are minimized by site design, time zoning, and implementing refuge regulations. Anticipated long-term impacts to wildlife and wildlife habitats of implementing the management action are positive. In the long run, wildlife habitat and increased opportunities for wildlife-dependent recreation opportunities could result in an increase in economic benefits to the local community.
6. Implementing the comprehensive conservation plan is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988, as actions will not result in development of buildings and/or structures within floodplain areas, nor will they result in irrevocable, long-term adverse impacts.

## **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.

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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 will take place through carefully controlled time and space zoning such as establishment of sanctuary areas, establishment of protection zones around key sites, such as sea turtle nests and Alabama beach mouse habitat, closures of unauthorized trails, and routing of new trails to avoid direct contact with sensitive areas, such as nesting bird habitat, etc. All public use activities will 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 will be utilized, and public use programs will 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 will 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 should not impact adjacent or in-holding landowners. Essential access to private property will continue to be allowed through issuance of special use permits. Future land acquisition will 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 will likely come from the Land and Water Conservation Fund or the Migratory Bird Conservation Act.

### **Land Ownership and Site Development**

Proposed acquisition efforts by the Service will 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 beach access points, trails, 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 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:

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All affected landowners  
Congressional representatives  
Governor of Alabama  
Alabama Department of Conservation and Natural Resources  
Alabama State Historic Preservation Officer  
Alabama Gulf Coast Convention and Visitors Bureau  
Alabama Gulf Coast Chamber of Commerce  
Mobile Bay National Estuary Program  
Gulf State Park  
Dauphin Island Sea Lab  
Fort Morgan Civic Association  
The Nature Conservancy of Alabama  
Local community officials  
Interested citizens

### **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 C.F.R. 1508.27), as addressed in the Environmental Assessment for the Bon Secour 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, pages 118-125, and pages 134-138).
2. The actions will not have a significant effect on public health and safety. (Environmental Assessment, page 130).
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, page 137).
4. The effects on the quality of the human environment are not likely to be highly controversial. (Environmental Assessment, pages 118-125, and pages 134-138).
5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment. (Environmental Assessment, page 130).
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, pages 118-125, and pages 134-138).
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, page 130).
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 129).

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9. The actions are not likely to adversely affect threatened or endangered species, or their habitats. (Environmental Assessment, pages 118-125).
  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 130).

**Supporting References**

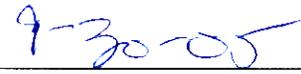
Fish and Wildlife Service. 2005. Draft Comprehensive Conservation Plan and Environmental Assessment for Bon Secour National Wildlife Refuge, Baldwin County, Alabama. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region.

**Document Availability**

The Environmental Assessment was Section B of the Draft Comprehensive Conservation Plan for Bon Secour National Wildlife Refuge and was made available in April 2005. Additional copies are available by writing: U.S. Fish and Wildlife Service, 1875 Century Boulevard, Suite 420, Atlanta, GA 30345.

**//S// Cynthia Dohner**

 Sam D. Hamilton  
Regional Director

  
Date



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Robert Cail  
Refuge Manager**

**12295 State Hwy180  
Gulf Shores, AL 36542**

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Fax: (251)540-730  
email: bonsecour@fws.gov**

**To report sea turtle nesting, stranding  
or to volunteer:  
1-866-SEA TURTLE  
(1-866-732-8878)**

**U.S. Fish & Wildlife Service  
1 800/344 WILD  
<http://www.fws.gov>**

**November 2005**

