

**FINAL DRAFT**

# Avian Conservation Implementation Plan Dry Tortugas National Park

National Park Service  
Southeast Region



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In cooperation with

DRTO Resource Management Staff, National Park Service  
And Bird Conservation Partners  
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## Introduction

This Avian Conservation Implementation Plan (ACIP) is provided to the staff at Dry Tortugas National Park (DRTO) to help identify and prioritize bird conservation opportunities, and to provide information and guidance for the successful implementation of needed conservation activities. This plan may identify goals, strategies, partnerships, and perhaps specific projects for the park to participate in existing bird conservation planning and implementation efforts associated with the North American Bird Conservation Initiative (NABCI). Under the auspice of NABCI, appropriate bird and habitat conservation goals may be recommended as identified in the appropriate existing national or regional bird conservation efforts aligned with this initiative: Partners In Flight (PIF), North American Waterfowl Management Plan (NAWMP), US Shorebird Conservation Plan (USSCP), and Waterbird Conservation for the Americas (WCA). For example, parks in the Appalachians and the Cumberland Plateau will have few if any high priority waterbird conservation issues at a regional landscape or greater scale. As such, little information regarding waterbird conservation will be presented in the ACIP, unless there is an identified park need for this species group, or other mandates, such as federal laws. Similarly, because DRTO is oceanic in nature, very few landbird conservation priorities will be made, except as they may relate to seabirds and coastal species utilizing the land base of DRTO. However, all high priority bird conservation issues for DRTO will be discussed and integrated as appropriate.

Information and data presented in the ACIP have been obtained from several sources: 1) interviews with DRTO staff 2) DRTO bird conservation partners 3) the PIF Subtropical Florida Bird Conservation Plan (in preparation) 4) NPS databases, 5) peer reviewed bird conservation and management literature, and 6) personal communications with bird conservation specialists throughout North America, especially in the southeastern United States. This plan has been reviewed by DRTO resource management staff and managers, South Florida/Caribbean Inventory and Monitoring (SF/C I&M) Network staff, and bird conservation partners and approved by DRTO management. Optimally, this plan will be incorporated into the park's natural resource planning and management documents and updated annually to reflect completed projects, newly identified needs, and shifts in bird conservation priorities in the region.

**DRTO is not obligated to undertake any of the proposed actions in this plan. The plan is provided to offer guidance to DRTO to voluntarily support important park, regional, and perhaps national and international bird conservation projects for which DRTO is a primary participant in the proposed actions.**

## Background

During the past thirty years, monitoring programs across North America have documented declines of certain bird species populations and their habitats, often severe (Sauer et al. 2000). The decline has caused great concern among scientists, biologists,

biodiversity proponents, ecologists, land managers, etc., and the bird conservation community in general. Birds are recognized as critical components of local and global genetic, species, and population diversity, providing important and often critical ecological, social, economic, and cultural values. Their overall decline has stimulated a worldwide focus on conservation efforts and North American interest in bird conservation is rapidly becoming a focus of government, non-government, industry, and private interests and expenditures.

Many state, federal, and non-governmental wildlife agencies and non-government organizations (NGO's) have recognized this alarming bird decline trend and have joined forces in several extensive partnerships to address the conservation needs of various bird groups and their habitats. The primary initiatives are:

- North American Waterfowl Management Plan
- Partners in Flight
- U.S. Shorebird Conservation Plan
- Waterbird Conservation for the Americas

**The North American Bird Conservation Initiative:** While efforts associated with these plans have generated some successes, it has been increasingly recognized that the overlapping conservation interests of these initiatives can be better served through more integrated planning and delivery of bird conservation. The *North American Bird Conservation Initiative (NABCI; <http://www.nabci-us.org/main2.html>)* arose out of this realization. The vision of NABCI is simply to see ***“populations and habitats of North America’s birds protected, restored and enhanced through coordinated efforts at international, national, regional, state and local levels, guided by sound science and effective management.”*** NABCI seeks to accomplish this vision through (1) broadening bird conservation partnerships, (2) working to increase the financial resources available for bird conservation in the U.S., and (3) enhancing the effectiveness of those resources and partnerships by facilitating integrated bird conservation (U.S. NABCI Committee 2000). Together, the four bird conservation initiatives mentioned above, as well as several other local and regional partnerships, work collectively to pursue this vision.

NABCI is guided by a set of principles that establish an operational framework within which the Initiative and its partners may conduct integrated bird conservation in the U.S. These will articulate a common understanding of the relationship between NABCI, the individual bird conservation initiatives, and all partner entities to ensure recognition of existing federal legislative and international treaty obligations, state authorities, and respect for the identity and autonomy of each initiative. The fundamental components of the conservation approach to be used by NABCI are expressed within its goal:

***To deliver the full spectrum of bird conservation through regionally-based, biologically-driven, landscape-oriented partnerships.***

**The Southeastern Bird Conservation Initiative: National Park Service:** In 1999, the Southeast Region of the National Park Service (NPS) recognized the importance of coordinating existing bird conservation goals into planning and operations of national park units in the southeast, that is, integration of NABCI. In support of this recognition, the Southeast Regional Office NPS approved and allocated eighty-eight thousand dollars, cost sharing 1:1 with the US Fish and Wildlife Service (FWS) Region 4 (Southeast) to hire a biologist to conduct this two-year project (Interagency Agreement FS028 01 0368). This project is unique in the NPS, and perhaps the nation, and represents a potential model for better coordinating regional bird conservation programs and activities within and outside the NPS. It further represents a progressive action toward institutionalizing bird conservation as a programmatic priority in the Southeast Region of NPS, and potentially the nation.

As envisioned, the integration of NABCI into the Southeastern NPS involves:

- 1) Development and delivery of Avian Conservation Implementation Plans,
- 2) Coordination with NPS Inventory and Monitoring Program,
- 3) Development of a web based project site,
- 4) Establishment or enhancement of bird conservation partnerships,
- 5) Identification and exploration of potential funding opportunities, and
- 6) Technical guidance and assistance as needed or requested.

This ACIP fulfills one aspect of the plan outlined above, and serves as a basis for future bird conservation actions in DRTO and with adjacent partners or landowners.

Concurrently, the development of a Memorandum of Understanding (MOU) between the FWS and the NPS (Appendix A) to implement Presidential Executive Order (EO) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (US Government 2000), calls for integration of programs and recommendations of existing bird conservation efforts into park planning and operations. Complementing each other, the MOU and the Southeastern Bird Conservation Initiative will advance bird conservation in the Southeast Region of the NPS beyond current regional NPS efforts.

## **Role of NPS in Avian Conservation**

The interagency agreement that facilitates this partnership supports both FWS and NPS management policies. Specifically for the NPS, the agreement supports and advances the Strategy for Collaboration, a visionary document developed and signed by the Southeast Natural Resource Leaders Advisory Group (SENRLAG 2000), a consortium of 13 land and resource management agencies in the Southeastern United States whose vision is to encourage and support cooperation in planning and managing the region's natural resources. Furthermore, the agreement is aligned with and implements a variety of NPS Management Policies (2001) including, but not limited to, External Threats and Opportunities, Environmental Leadership, Cooperative Planning, Land Protection, and especially Natural Resource Management that details policy and

management guidelines which apply to bird conservation. Important policies in the Natural Resource Management chapter include:

- Planning for Natural Resource Management
- Partnerships
- Restoration of Natural Systems
- Studies and Collection
- General Principles for Managing Biological Resources
- Plant and Animal Population Management Principles
- Management of Native Plants and Animals
- Management of Endangered Plants and Animals
- Management of Natural Landscapes
- Management of Exotic Species
- Pest Management
- Fire Management and
- Water Resource Management

The NPS is the fourth largest landowner in the United States, consisting of over 380 national park units covering 83 million acres of land and water with associated biotic resources ([www.nps.gov](http://www.nps.gov)). The 64 units in the Southeast Region of the NPS represent 16% of the total number of park units in the national park system and cover approximately 5% of the total land base in the entire system. Park units in the Southeast Region include national seashores (Canaveral National Seashore, Cape Hatteras National Seashore), national parks (Great Smoky Mountains National Park, Dry Tortugas National Park), national recreation areas (Big South Fork National River and Recreation Area), national preserves (Big Cypress National Preserve), national battlefields (Cowpens National Battlefield, Fort Donelson National Battlefield), national monuments (Fort Matanzas National Monument, Ocmulgee National Monument), and others such as the Blue Ridge Parkway, Obed Wild and Scenic River, and Timicuan Ecological and Historic Preserve.

Southeast NPS units provide habitat for over 400 species of migrating, breeding, and wintering birds and include a wide range of Federal and State listed threatened and endangered species. Likewise, these units also provide nest, migration, and winter habitat for most of the eastern species identified in the national bird conservation plans in need of conservation attention.

Additionally, the NPS attracts over 280 million visitors to the parks each year, 120 million of these in the Southeast Region, affording excellent recreational bird watching and opportunities to strengthen bird conservation interpretation, outreach, and education programs. These opportunities, the NPS mission, policies, and organization all lead to the conclusion that the NPS is an extremely valuable partner and contributor to bird conservation in the region.

Nationally, the status of birds in national parks is largely unknown, although many parks have adequate knowledge regarding bird occurrence in the parks (<http://www.npwrc.usgs.gov/resource/othrdata/chekbird/chekbird.htm>). Parks often play a role in ongoing regional bird conservation efforts. Indeed many of these parks are often important to regional, national, or international bird conservation, and many have been designated as Important Bird Areas (IBA's) by the National Audubon Society. To date, there are approximately 64 NPS units that are designated IBA's, 35 of which are considered of global importance (<http://abcbirds.org/iba/aboutiba.htm>). In the Southeast Region, the NPS has 13 global IBA's.

The **NPS Inventory and Monitoring (I&M) Program** has been developed to provide management driven scientific information to national park managers so that resources can be adequately protected within national parks. One of the first phases of this program is to inventory vertebrates, including birds, within the 260 national park units in the program. Once completed, data from the inventories will provide an account of the occurrence and abundance of birds in all the national parks in the program. These records will be stored in the NPS I&M NPSpecies database (<http://www.nature.nps.gov/im/apps/npspp/>). Coordination with I&M network staff is important to developing long-term bird monitoring programs that fulfill both park and NABCI objectives.

**Park Flight** is a NPS international partnership initiative that directs funding toward a variety of NPS programs that involve conservation of Neotropical migratory birds whose life history range covers a U.S. national park and a Latin American protected area. A relatively new program, Park Flight offers parks the opportunity to partner with a Latin American national park or protected area to cooperate on developing bird conservation and education projects (USDI NPS 2002).

Recent increases in NPS base funded programs such as inventory and monitoring, exotic species management, habitat restoration, and fire management all indicate that national park managers recognize that park lands are increasingly subject to a variety of threats and conditions that must be improved to provide the quality of national park experience articulated in the NPS Organic Act (1916). Programmatic funding in these areas will increase the ability of national parks to provide quality habitat and conditions for increased wildlife conservation, including birds. Furthermore, private interests and non-profit conservation organizations have initiated programs, including grant programs, to provide much needed funding to national parks to meet backlogs of identified yet unfunded needs.

## **Park Description**

Almost 70 miles (112.9 km) west of Key West lies a cluster of seven islands, composed of coral reefs and sand, called the Dry Tortugas. Fort Jefferson National Monument was established by Presidential Proclamation on January 4, 1935, to protect historic Fort Jefferson, a military and architecturally significant nineteenth century fort.

Congress re-designated the 25,900 ha (64,000 acres) area as a National Park in October 1992 to provide additional management protection for the area's subtropical marine system, including coral reefs, fisheries, nesting birds and sea turtles, and other wildlife (Public Law 102-525). Dry Tortugas National Park possesses one of the greatest concentrations of historic shipwrecks in North America, with some vessels dating back to the 1600's. Because of its isolation, the islands, magnificent subtropical waters and coral reefs serve as an important resting place for migrating birds and a foraging and nesting place for sea turtles. Pristine subtropical waters, lush coral and seagrass habitat, and hundreds of species of birds and fish affords scientists an outstanding opportunity for education and scientific research. Some of the earliest known coral reef investigations date back to the 1880's when the Carnegie Institution operated one of the first subtropical marine science laboratories in the Western Hemisphere on Loggerhead Key (Sasso and Patterson 2000).

## **Avian Resources of Subtropical Florida**

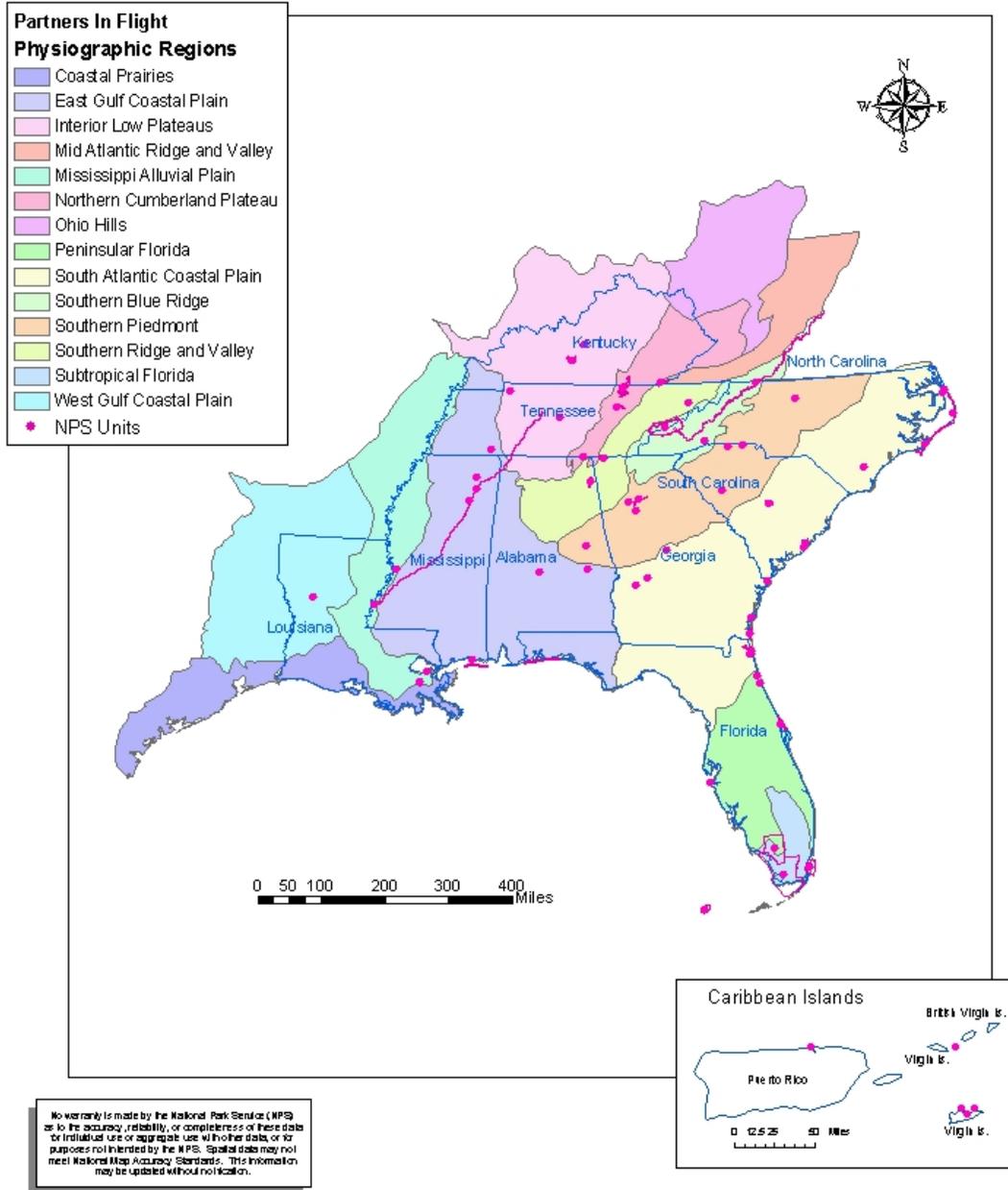
This physiographic area is entirely contained within Florida, and extends from the northern edge of Lake Okeechobee south through the Florida Keys (see PIF and NPS locations maps below). The region has very little topographic relief, but slight changes in elevation have important consequences for vegetation and the diversity of habitat types. The highest points of elevation are less than 2 meters and correspond with fairly recent shorelines (less than 5,000 years before present). Underlying sediments consist of freshwater marl, peat, freshwater lake and marine sediments, and to a lesser extent, sand deposited during the Pleistocene and Holocene. The subtropical Florida region can be divided into four smaller sub-regions: 1) the Everglades, 2) Big Cypress, 3) Miami Ridge and Atlantic Coastal Ridge, and 4) Southern Coasts and Islands. The Everglades is the most extensive of these areas, followed by the Big Cypress, Miami Ridge and Southern Coasts. Across all subregions, much of the physical and ecological characteristics of the region resemble tropical ecosystems where seasonal changes are reflected by changing rainfall patterns rather than by dramatic temperature changes. Distinctive dry (winter/spring) and wet (summer) seasons occur annually, and the nesting cycles of many birds are tied to these changes. At least two major forms of disturbance play key roles in the ecology of the region. Fire is an important feature in many pine dominated communities and many marsh and prairie communities. Frequent fires are essential in pine-dominated stands and prairies if understory conditions suitable to many nesting birds are to be maintained. However, the ideal fire frequency in some pine communities is not known. Hurricanes are a second form of disturbance that less frequently but predictably provide early successional habitats or open forest cover (Partners in Flight 2000).

Bird conservation priorities for Subtropical Florida have been stratified by habitat type. Recognized habitat types where high priority conservation actions are needed for both birds and habitats are pine forests (including pine rocklands, pine Flatwoods, sand

# Partners in Flight (PIF) Regions

Southeast Region (SER)

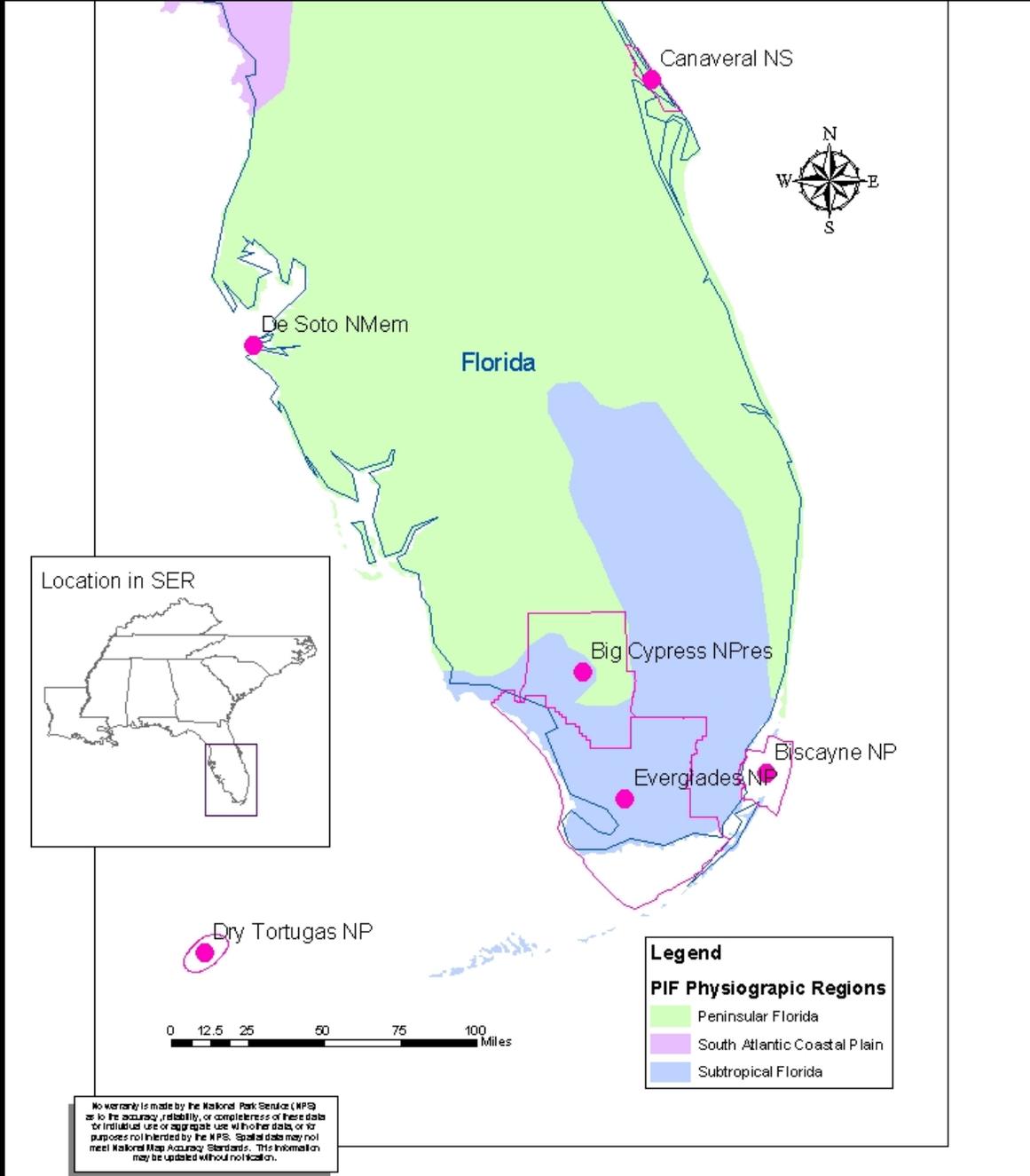
National Park Service  
U.S. Department of the Interior



# Partners in Flight (PIF) Regions and NPS Locations

National Park Service  
U.S. Department of the Interior

Southeast Region (SER)



Produced by Southeast Region GIS, Atlanta, GA

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pine scrub), grassland/grassland-scrub (including dry prairie and coastal strands), subtropical deciduous forest, Everglades, brackish saltwater and freshwater marsh, and mangrove swamps. Species associated with each of these habitats and identified as high priority for conservation needs are given below.

Florida Scrub Jay, Red-cockaded Woodpecker, Southeastern American Kestrel, Brown-headed Nuthatch, Bachman's Sparrow, Pine Warbler and Sedge Wren are associated with the pine forests. Both Florida Scrub Jay and Southeastern American Kestrel have been extirpated in Subtropical Florida and the Brown-headed Nuthatch and Bachman's Sparrow are nearly extirpated here. Both Palm Warbler and Sedge Wren are present only in the non-breeding seasons.

Grasshopper Sparrow, Crested Caracara, Burrowing Owl, Sandhill Crane and Mottled Duck are all species associated with grassland to grassland scrub habitats. Grasshopper Sparrow has been extirpated in South Florida.

In the subtropical deciduous forest, Short-tailed Hawk, Swallow-tailed Kite and Gray Kingbird are high priorities for conservation.

In the Everglades, brackish saltwater and freshwater marshes, Snail Kite, Cape Sable Seaside Sparrow, Wood Stork, Black Rail, Reddish Egret, Yellow Rail, White Ibis, and Clapper Rail are species of conservation attention.

Prairie Warbler, Yellow Warbler, Black-whiskered Vireo White-crowned Pigeon, and Mangrove Cuckoo, species associated with Mangrove swamps and forests, are of high priority conservation concern.

Human population growth has been phenomenal in subtropical Florida for the last 40 years. The impacts of such tremendous growth include increased infrastructure that directly reduces habitat availability, but also secondary impacts to bird habitats, such as pollution. Other land uses include production of sugarcane, winter vegetables, and citrus. Drastic changes in hydroperiod and natural water cycles are secondary impacts of increasingly intensive agriculture. However, among the best opportunities in the Southeast to work with existing public lands occur in Subtropical Florida, where over 54% of the area is publicly owned. Therefore, primary conservation programs include efforts to reduce impacts from adjacent or nearby lands on management of existing public lands. Many programs have been developed and are in various phases of implementation. These include the Save Our Everglades program, the Surface Water Improvement and Management Act, Florida's everglades Forever Act and the development of the South Florida Ecosystem Restoration Task Force as well as aggressive acquisition programs. These and other programs serve the basis for bird conservation efforts in the region.

This description of South Florida avifaunal conservation priorities hardly seems relevant to DRTO. Indeed, DRTO has a bird fauna more similar to the Caribbean region

than Subtropical Florida. Yet, bird conservation plans for both Subtropical Florida and Puerto Rico and the US Virgin Islands do not adequately address priority bird conservation issues in DRTO. However, because bird conservation priorities are more closely affiliated with the Caribbean, recommendations in this plan will be tiered to the Puerto Rico and US Virgin Islands bird conservation plan.

## **Avian Conservation in DRTO**

**Avian Biodiversity:** DRTO has an avian inventory and a checklist of birds that is available for the public. Managers recognize the need to update the inventory and checklist. Approximately 291 species have been observed in the Dry Tortugas, yet only 7 species regularly nest there. This number seems low, especially considering that numbers of birds in spring often exceed 100,000. However, these large numbers are the result of nesting Sooty Tern and Brown Noddy. Other regular nesters there are Masked Booby, Magnificent Frigatebird (only colony in US jurisdiction), Mourning Dove, and Brown Pelican.

Verified records of birds in DRTO have been entered into the NPS I&M program's database, NPSpecies, and may be viewed via the internet at <http://www.nature.nps.gov/im/app/npspp> with a user identification and password combination authorized by the NPS for NPS personnel and NPS cooperators. Many other avian observational data need to be verified and entered into the database.

**Inventory:** The park's avian inventory has been recognized as important information for park managers and is considered complete within the framework of the NPS I&M Program. DRTO is one of seven parks in the NPS South Florida/Caribbean I&M Network for which a plan to conduct high priority inventory projects has been prepared (Sasso and Patterson 2000). At this time, no inventory efforts are planned for DRTO.

**Threatened and Endangered Species:** Two federally listed threatened species occur in DRTO, the Brown Pelican and Roseate Tern. The Brown Pelican nests in the park and the Roseate Tern is now an irregular nesting species and regular winter resident.

One additional Florida listed species, the Least Tern, occurs in DRTO. Other transient species occurring in DRTO are listed in several states, signifying the park's importance to bird migration.

**Park Priorities:** Park staff and consultants have identified the Sooty Tern, Magnificent Frigatebird and Brown Noddy as species of significant management concern and high priority for conservation. Additionally, the park's significance as a stopover for Neotropical migrants is well known remains a high priority for conservation attention.

**Monitoring:** Currently, several avian monitoring projects are being conducted at DRTO. These are:

- Sooty Tern and Brown Noddy colony monitoring using point count index methodology; vegetation is also monitored at these sites
- Migration monitoring by private interests, mainly for Neotropical migrants
- Brown Pelican, Masked Booby, and Magnificent Frigatebird colony monitoring using direct count methodology

Randomized recreational birding provides additional bird observation data.

**Research:** Scientific research is permitted within the park, and currently two projects are ongoing. These are:

- Long-term banding of Sooty Tern chicks in 3 m square plots to track parentage and nest site fidelity
- Determination of causes in shift of breeding season for Sooty Tern, including an analysis of all environmental variables possibly associated with Sooty Tern nesting

**Outreach:** Some educational information related to birds is conveyed to visitors to DRTO.

- Law enforcement staff inform visitors of the importance of and protecting the tern colonies, as well as other waterbirds
- An observation log is maintained in the visitor center where
- In visitor center, information is available on the practice of gull feeding by visitors
- In visitor center, information is available on importance of DRTO for landbird migration

## **Park Identified Needs for Avian Conservation**

DRTO has identified several projects that would increase the avian knowledge of the park. They are:

### *Inventory:*

- better understand the role the park has for fall migrants

### *Monitoring:*

- Christmas Bird Count
- Scientifically based Migration Monitoring

### *Research:*

- Sooty Tern colony banding is desired
- Nesting chronology and demography of the Magnificent Frigatebird Colony
- Masked Booby nesting chronology and reproductive success
- Determination of importance of DRTO as a migration stopover

### *Data Management:*

- Verify and enter avian observational data into NPSpecies, eBird, or another appropriate database (DRTO data is stored in Everglades National Park databases)

## **Coordination with Regional Conservation Initiatives**

**North American Bird Conservation Initiative:** NABCI bird conservation planning units, referred to as Bird Conservation Regions (BCR), are often larger than other planning units associated with other plans, such as Partners In Flight. For example, DRTO is within the NABCI Peninsular Florida BCR that covers all of Southern Florida south of approximately Jacksonville (see NABCI BCR map below) and encompasses two PIF physiographic areas (the planning unit for PIF)(compare to PIF map).

Several NABCI BCR's have coordinators whose primary responsibility is to coordinate all bird conservation planning in the BCR, across all agencies and organizations. Currently, the Peninsular Florida BCR does not have a designated coordinator; however, the Atlantic Coast Joint Venture (ACJV) has staff that with responsibility to provide bird conservation assistance to agencies and organizations in the area. This staff can provide valuable assistance to DRTO with implementation of aspects of this ACIP.

**North American Waterfowl Management Plan (NAWMP):** The NAWMP (<http://northamerican.fws.gov/NAWMP/nawmphp.htm>) is completed and has been revised several times, incorporating updated goals and strategies based on new information. This plan is one of the most successful bird conservation delivery programs in the United States, being monetarily supported by the North American Wetlands Conservation Act (NAWCA). The ACJV coordinators are responsible for coordination and implementation of this program.

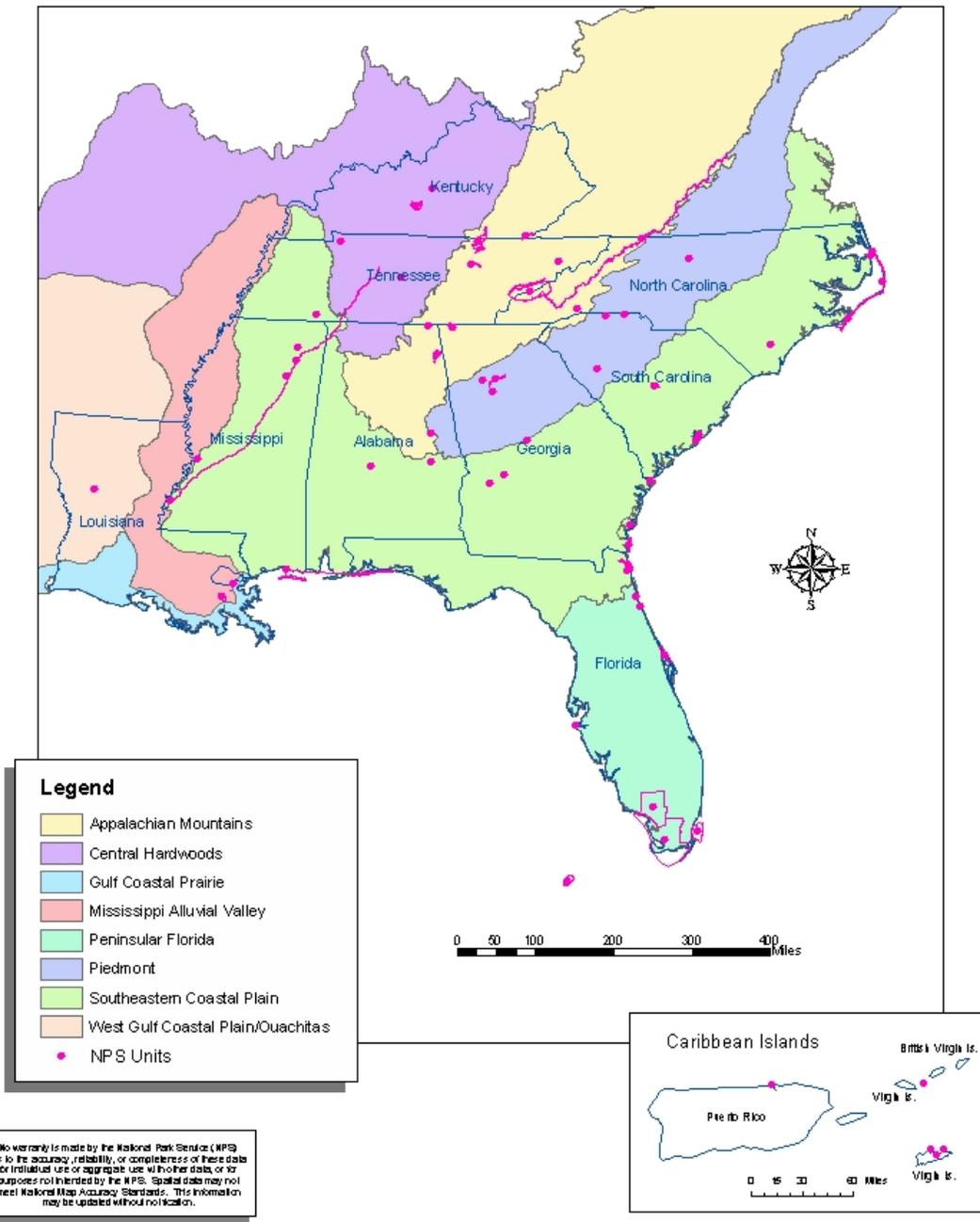
**Partners In Flight:** Goals and strategies for the Subtropical Florida are not yet fully developed into a draft bird conservation plan. However, as previously noted, bird conservation priorities for DRTO are better aligned with Puerto Rico and the US Virgin Islands goals, yet are largely the responsibility of the NPS and the State of Florida, an arrangement that can make bird conservation at DRTO challenging.

Similar to NABCI BCR's, PIF physiographic areas often do not have designated coordinators. However, state level non-game agencies with investment in PIF will establish key personnel to develop partnerships among cooperators in the physiographic area. The State of Florida has a non-game bird coordinator who can be instrumental in assisting DRTO to implement recommendations identified in this ACIP and projects important to bird conservation relative to Florida and the Caribbean's role in implementation of the respective geographical plans.

# Bird Conservation Regions

Southeast Region (SER)

National Park Service  
U.S. Department of the Interior



Produced by Southeast Regional Office GIS, Atlanta, GA

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**United States Shorebird Conservation Plan (USSCP):** The USSCP has been completed and is available on the World Wide Web (<http://shorebirdplan.fws.gov/>). A regional step down plan is in preparation by FWS personnel and should be available in 2003.

**Waterbird Conservation for the Americas (WCA):** The WCA plan has been completed and is available on the World Wide Web or can be ordered from the US Fish and Wildlife Service National Conservation Training Center (<http://www.waterbirdconservation.org/>). Most conservation priorities for DRTO are for waterbirds and this plan will eventually provide the best guidance for DRTO bird conservation.

## **Integration of NABCI Goals and Objectives into Park Planning and Operations**

### **NABCI Implementation Recommendations**

To successfully achieve park-established goals and actively participate in NABCI, the park could implement a variety of projects in different NPS programs. Most of these projects would require some level of participation by many existing park programs and could either be achieved through NPS funding, or more likely, through establishing or improving partnerships with agencies and organizations that already have the necessary expertise to provide guidance, funding, and execution of these programs. Programmatic areas where bird conservation actions are likely to be focused are:

- Inventory
- Monitoring
- Habitat Restoration
- Threat Management (includes exotic species, air quality, water quality, etc.)
- Research
- Compliance
- Outreach
- Partnerships

To the extent appropriate, each of these program areas will be discussed separately and within each, specific opportunities identified that, when implemented, will enable to park to meet its mandates (current and expected) as well as integrate NABCI into its planning and operations. With emphasis added, the park is not expected to implement any of these recommendations or be obligated to pursue any opportunity other than those the park is required to do by law or NPS program or policy. In other words, participation in this effort is currently voluntary. However, implementation of EO 13186 (US Government 2000) will require NPS to incorporate a wide range of bird conservation programs into planning and operations. The development of the MOU between the FWS and the NPS will establish a formal agreement to promote bird

conservation within the agency by incorporating goals and strategies of existing bird conservation initiatives, plans, and goals into park planning and operations.

Should the park decide to implement any of these projects, further consultation with bird conservation contacts is encouraged to obtain updated information on the relevance of these opportunities in regional bird conservation.

High priority projects are identified in **bold** print. Priorities that the park is encouraged to seek NPS funding for are marked with an asterisk (\*). These projects are those that are critical to the stabilization or improvement of a bird population in the planning region.

**Inventory:** The park has inventoried its bird fauna exceptionally well. Although Nonetheless, additional information is needed on fall migration. DRTO is encouraged to:

- **establish a migration monitoring program throughout the islands to determine use of DRTO by fall migrants\***

Additionally, DRTO is encouraged to

- **verify other avian observational data collected in the park and enter into the appropriate database (Everglades NP databases, NPSpecies, eBird, or other appropriate database)\***
- **standardize inventory and monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000)**

**Monitoring:** The park's bird monitoring program is focused on waterbird colonies, two of which occur nowhere else in the United States. Efforts should be made to continue existing monitoring programs and to ensure that park efforts contribute to park or regional bird conservation rather than undertake an action or actions that are not needed or are better conducted in other areas. Specific recommendations are to:

- **continue to conduct existing monitoring programs and enter data into the appropriate databases (NPSpecies, eBird, or other appropriate database)\***
- **communicate with other biologists and research scientists working with Sooty Tern, Brown Noddy, and Magnificent Frigatebird to determine DRTO's importance for these nesting species\***
- **establish a scientifically based landbird migration monitoring program to document use of DRTO during landbird migrations\***
- **establish a gull monitoring program to document increase in gulls and gull predation**

- **establish a Christmas Bird Count area centered on the Dry Tortugas**
- **standardize inventory and monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000)**

**Habitat Restoration:** Recently, habitat restoration efforts have increased on NPS lands due to the increased restoration emphasis of the Management Policies (USDI NPS 2001). Parks may use a wide range of management tools to restore wetland, grassland, woodland, and other habitats. Restoration tools include, but are not limited to, forest management practices (e.g. silviculture), prescribed fire, exotic species management, and public use and recreation management. In addition, parks can coordinate infrastructure development (e.g. roads and buildings) with restoration activities to mitigate potential adverse impacts.

Due to the protected nature of DRTO lands, and generally those in the national park system, the condition of habitats for bird use may be of higher quality than other natural, developed, agricultural, or forest lands under other management regimes. However, national park lands can be greatly improved for wildlife, and particularly bird use, by restoring processes important for habitat formation, succession, and structural development. Largely, these processes have not been managed historically in the national park system but current policy allows for active management of species, populations, and lands to provide for long-term conservation of park resources. Protection of habitats in DRTO can contribute to continued waterbird colony nesting, thus contributing to species population goals in South Florida and the Caribbean.

The park is entirely oceanic island park subject to the forces generated upon and moving across the ocean surfaces. Tropical storms, tidal fluctuations, and sea level rise are processes that influence the dynamic landscape of DRTO and likewise, the waterbird colonies. Specific recommendations are to:

- **maintain or enhance water quality in surrounding waters to support aquatic biota necessary to support existing tern and waterbird colonies\***
- **manage vegetation on Bush Key to assure Sooty Tern and Brown Noddy have adequate and suitable nesting area\***
- **determine feasibility to improve habitat for nesting Masked Booby and implement appropriate actions to improve habitat for nesting Masked Booby\***
- **preserve remaining coastal hammock forests and shrub scrub habitats for migrating land birds\***

- **document all major habitat management activities, including location (e.g. UTM coordinates) and a description of methods and of pre- and post-management habitat conditions. This information, when coupled with bird distribution and abundance data, is useful for assessing and replicating conservation actions**

**Threat Management:** Potentially the greatest impact to birds at DRTO is the presence of rats. The recent establishment of a land bridge between Fort Jefferson and Bush Key, where the tern colonies reside, could result rat predation of the tern colony. However, park staff have responded with an aggressive trapping program and rats do not seem to be negatively impacting the tern colony. The park is encouraged to:

- **continue the aggressive removal of rats from Bush Key, striving to eradicate all rats\***
- **consider removing the land bridge between Garden and Bush Key to prevent future invasions of mammalian predators and unauthorized visitors and associated disturbance**
- **eliminate gull feeding by visiting public and potentially reduce gull populations to reduce predation on Sooty Terns**
- **manage commercial fishing offal to eliminate attraction to gulls**
- **assess and managed gull predation on Sooty Tern**
- **manage fishing practices that impact fish eating birds**

Exotic vegetation has been well managed at DRTO. Efforts should continue to

- **monitor and manage exotic vegetation**

**Research:** Several research projects have been identified that could improve bird conservation for birds at DRTO and contribute to increased bird conservation efforts for these species in the Caribbean. These projects are:

- **Sooty Tern colony banding is desired (10K)\***
- **demography and nesting chronology of the Magnificent Frigatebird\***
- **determination of importance of DRTO as a migration stopover\***
- **Masked Booby nesting chronology and reproductive success\***

- **assess gull population dynamics and gull predation on Sooty Tern colony\***
- **impact assessment of fishing gear on fish feeding birds**
- **continue to improve knowledge on developing mangrove forest and potential for increased bird nesting**
- **list park needs and projects on Research Permit and Reporting System web site (RPRS)**
- develop contact with South Florida/Caribbean Cooperative Ecosystem Studies Unit (CESU) at the Rosentiel School of Marine and Atmospheric Sciences at the University of Miami, FL.

**Compliance:** Park compliance with the Migratory Bird Treaty Act and the Executive Order 13186 (US Government 2000) is necessary to assure that park activities incorporate bird conservation into park planning and operations. Further, to ensure that migratory birds are considered in all phases of park planning processes, especially during the National Environmental Policy Act (NEPA) and the Director's Order #12 Compliance processes, the park should consider adding specific language in project evaluations that requires consideration and implications of park projects on migratory birds. The MOU being developed between the NPS and the FWS will likely contain specific language requiring a park to consider implications of park projects on migratory birds, particularly those species identified in the USFWS Species of Conservation Concern 2002 (Appendix D). Additional considerations are to encourage:

- **park staff to begin specific consideration of migratory birds during park planning processes\***
- park staff to attend USFWS training on implementation of EO 13186 at the National Conservation Training Center (NCTC) (when available) or other training on migratory bird conservation in North America. NCTC has several courses and training related to conservation of migratory birds (<http://training.fws.gov/courses.html>).

The USFWS NCTC offers and reserves two tuition free slots for National Park Service employees wishing to attend NCTC courses on a first come, first served basis. Additionally, discount lodging is also available while attending a NCTC course.

## **Outreach**

- **participate in International Migratory Bird Day (IMBD) events with a local partner (<http://birds.fws.gov/imbd.html>)**

- encourage development of outreach and educational programs to enhance visibility of bird conservation issues, which may include organized bird walks, migration monitoring, and perhaps waterbird colony visits\*
- develop educational/outreach program for park fishing persons to avoid or minimize impacts or injury to fish eating birds\*
- develop aggressive outreach and enforcement program to eliminate gull feeding by visiting public\*
- encourage accurate documentation and reporting from randomized outings by visitors (see Cornell University's eBird monitoring program (Cornell Lab. Ornith. 2002 (<http://www.ebird.org/about/index.jsp>))\*
- park interpretation/education staff are encouraged to attend USFWS training on Migratory Bird Education at NCTC
- consider adding links to bird conservation information, data, etc. to the park's web site home page
- support bird conservation by serving shade-grown coffees at meetings, events, and the office buildings in the park (<http://www.americanbirding.org/programs/consbcof3.htm>)
- subscribe to Florida Birds, an electronic forum for listing bird sightings and publications in Florida

**Partners and Partnerships:** Partnerships for habitat conservation and protection will perhaps have the greatest positive influence on bird conservation above all other landscape scale planning. Specific recommendations are to:

- **keep abreast of initiatives that may affect water quality in and around DRTO\***
- **partner with Caribbean seabird experts to collaborate on conservation issues with DRTO waterbird colonies\***
- **continue to develop and strengthen relationship with local bird clubs such as the Key West Audubon Society and Tropical Audubon Society to coordinate and conduct park bird conservation projects\***
- **develop partnership with USFWS, particularly with Key West National Wildlife Refuge\***

- **contact the nearest Joint Venture office (see Funding section for explanation of Joint Ventures) or BCR coordinator to develop partnerships and funding proposals tiered to priorities established by the park, this ACIP, and the bird conservation plans that pertain to DRTO**

**Funding Opportunities:** Internal NPS funding is often an effective source to obtain funding; however, the project will have to be a fairly high priority among the park's natural resource program to successfully compete for the limited funding available in the NPS. Therefore, partnerships and outside funding programs are often more productive for securing bird conservation funding. Funding for conservation projects for Neotropical migrants is also available through the Park Flight program. DRTO is encouraged to enter all high priority projects into the NPS Performance Management Information System (PMIS) database. Needed at DRTO is:

- **increased base funding to implement basic protection and management needs for birds and their habitats (habitat-based management not only benefits the birds but other wildlife as well)**

With the exception of the North American Waterfowl Management Plan (NAWMP and its associated funding legislation, the North American Wetland Conservation Act), funding opportunities for bird conservation programs, plans, and initiatives have been lacking. Only within the last decade have other appropriate and specific sources for bird conservation funding been created and used. The NAWMP has been supported for approximately 14 years by the North American Wetlands Conservation Act (NAWCA 1989). This program has provided \$487 million in appropriated funds matched with \$1.7 billion for wetland and bird conservation projects since its inception. In 2002 alone, over \$70 million US dollars were awarded to US and Canadian agencies and organizations to enhance waterfowl populations by improving, restoring, or protecting wetland habitats. To adequately evaluate projects and distribute these funds, partnerships called Joint Ventures were established. Nationally, 14 (11 US, 3 Canada) Joint Ventures have been established, several which are funded and staffed. Internet links to Joint Ventures are:

(<http://southwest.fws.gov/gulfcoastjv/ojvcontact.html>) and  
(<http://northamerican.fws.gov/NAWMP/jv.htm>).

Funding through NAWCA is highly underutilized by the NPS and any park unit that has wetland, water, or bird conservation needs associated with wetland are encouraged to investigate using this funding source. Naturally, there are certain requirements to be eligible for all grants and park managers are encouraged to consult with the nearest Joint Venture, BCR, PIF Coordinator, to learn how this program might be applicable to implementation of this plan, and other park wetland issues. DRTO should contact the ACJV assistant coordinator to investigate use of this funding source and developing proposals for implementation of portions of this plan.

Internal FWS funding programs may be used to support projects, but no effective method of project proposal delivery to these sources is currently in place for the NPS. Current funding in these programs may result from FWS familiarity with NPS needs, or NPS participation in one of the area FWS Ecosystem Teams, where a project has been identified and proposed to be funded through the Ecosystem Team.

Specific congressional appropriations to protect migratory birds has recently been authorized under the Neotropical Migratory Bird Conservation Act (2000) (<http://www.nfwf.org/programs/nmbcapp.htm>). Appropriations through this Act are authorized up to \$5 million per year. However, in 2000, appropriation was approximately \$3.75 million and a majority of this funding was directed toward projects in Central and South America.

Many of the identified projects are eligible for funding under various grant programs of the National Fish and Wildlife Foundation (<http://www.nfwf.org/programs/programs.htm>).

Other prominent funding sources available to NPS managers for bird conservation are listed on this projects web site at: <http://southeast.fws.gov/birds/NPSHighlits.htm>.

Funding opportunities for migratory bird conservation are available yet most natural resource agencies are not fully aware of and/or understanding of how to use these sources. Perhaps a consolidated migratory bird funding source catalog will become available to managers in the future; this is needed.

**Contacts:** Primary contacts within the region can be obtained by viewing the web site for the Southeastern Bird Conservation Initiative, National Park Service at <http://southeast.fws.gov/birds/npsbirds.htm>. This web site will provide contact information of the appropriate bird conservation coordinator in the region for park personnel. Primary contacts for DRTO are:

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APPENDIX A

EXCERPT FROM SOUTHEAST WATERBIRD CONSERVATION PLAN  
PRIORITY BREEDING COLONIAL BIRDS

Appendix I. BREEDING COLONIAL WATERBIRD SCORES AND STATUS FOR THE SOUTHEAST U.S. WATERBIRD CONSERVATION PLAN\*

DRAFT (September 8, 2003)

| Species/Region<br>(Colonial<br>Breeding<br>Waterbirds) | PT | PS | TB | TN | BD | ND | SUB<br>TOT | AI | TOT | WL | Tier | Act.<br>Leve<br>l | Per.<br>Resp.  | Est.<br>Pop<br>. Cat. | Pop.<br>Obj.<br>Cat. |
|--|----|----|----|----|----|----|------------|----|-----|----|------|-------------------|----------------|-----------------------|----------------------|
| <b>Masked Booby</b>                                    | 4  | 4  | 4  | 3  | 3  | 2  | 20         |    |     | 15 |      |                   | <1 global      |                       |                      |
| Southeast U.S.<br>Reg.                                 | 2  |    | 4  | 3  |    |    |            | 2  | 20  |    | I b  | PR                | 100us-<br>can  | 2                     | 2                    |
| PENFL (BCR 31)   | 2  |    | 4  | 3  |    |    |            | 2  | 20  |    | I b  | PR                | 100 reg.       | 2                     | 2                    |
| STFL   | 2  |    | 4  | 3  |    |    |            | 2  | 20  |    | I b  | PR                | (100)          |                       |                      |
| <b>Brown Pelican</b>                                   | 1  | 4  | 3  | 2  | 3  | 3  | 16         |    |     |    |      |                   | 45 global      |                       |                      |
| PENFL (BCR 31)   | 3  |    | 3  | 2  |    |    |            | 5  | 23  |    | II a | MA                | 22 reg.        | 7a                    |                      |
| PENFL<br>(BBS)   | 4  |    | 4  | 2  |    |    |            | 5  | 25  |    | II a | MA                |                |                       |                      |
| STFL   | 2  |    | 3  | 2  |    |    |            | 5  | 20  |    | II c | PR                |                |                       |                      |
| <b>Magnificent<br/>Frigatebird</b>                     | 4  | 4  | 4  | 3  | 4  | 3  | 22         |    |     | 16 |      |                   | <1 global      |                       |                      |
| Southeast U.S.<br>Reg.                                 | 5  |    | 5  | 3  |    |    |            | 2  | 26  |    | I c  | IM                | 100 us-<br>can | 3                     | 4                    |

| Species/Region<br>(Colonial<br>Breeding<br>Waterbirds)        | PT | PS | TB | TN | BD | ND | SUB<br>TOT | AI | TOT   | WL | Tier | Act.<br>Leve<br>l | Per.<br>Resp.  | Est.<br>Pop<br>. Cat. | Pop.<br>Obj.<br>Cat. |
|---|----|----|----|----|----|----|------------|----|-------|----|------|-------------------|----------------|-----------------------|----------------------|
| PENFL (BCR 31)  | 5  |    | 5  | 3  |    |    |            | 2  | 26    |    | I c  | IM                | 100 reg.       | 3                     |                      |
| <b>Roseate Tern</b>   | 4  | 5  | 4  | 3  | 3  | 3  | 22         |    |       | 16 |      |                   | 1 global       |                       |                      |
| (North American-<br>West<br>Indies/Florida<br>breeding pops.) | 4  | 5  | 4  | 3  | 5  | 5  |            |    |       |    |      |                   |                |                       |                      |
| Southeast U.S.<br>Reg.  | 3  |    | 4  | 3  |    |    |            | 2  | 27/23 |    | I b  | IM                | 7 us-can       | 4                     | 5                    |
| PENFL (BCR 31)  | 3  |    | 4  | 3  |    |    |            | 2  | 27/23 |    | I b  | IM                | 100 reg.       | 4                     |                      |
| STFL  | 3  |    | 4  | 3  |    |    |            | 2  | 27/23 |    | I b  | IM                | (100)          |                       |                      |
| <b>Sooty Tern</b>   | 3  | 2  | 3  | 2  | 3  | 2  | 15         |    |       |    |      |                   | <1 global      |                       |                      |
| Southeast U.S.<br>Reg.  | 2  |    | 3  | 2  |    |    |            | 5  | 19    |    | II c | PR                | 100 us-<br>can | 8                     | 8a                   |
| PENFL (BCR 31)  | 2  |    | 3  | 2  |    |    |            | 5  | 19    |    | II c | PR                | 99 reg.        | 8                     |                      |
| STFL  | 2  |    | 3  | 2  |    |    |            | 5  | 19    |    | II c | PR                |                |                       |                      |
| <b>Brown Noddy</b>  | 3  | 3  | 3  | 2  | 3  | 2  | 16         |    |       |    |      |                   | <1 global      |                       |                      |
| Southeast U.S.<br>Reg.  | 2  |    | 3  | 2  |    |    |            | 4  | 19    |    | II c | PR                | 100 us-<br>can | 6                     | 6a                   |
| PENFL (BCR 31)  | 2  |    | 3  | 2  |    |    |            | 4  | 19    |    | II c | PR                | 100 reg.       | 6                     |                      |

| Species/Region<br>(Colonial<br>Breeding<br>Waterbirds) | PT | PS | TB | TN | BD | ND | SUB<br>TOT | AI | TOT | WL | Tier        | Act.<br>Leve<br>I | Per.<br>Resp. | Est.<br>Pop<br>.<br>Cat. | Pop.<br>Obj.<br>Cat. |
|--|----|----|----|----|----|----|------------|----|-----|----|-------------|-------------------|---------------|--------------------------|----------------------|
| STFL   | 2  |    | 3  | 2  |    |    |            | 4  | 19  |    | <i>II c</i> | <i>PR</i>         | (100)         |                          |                      |

**\*Region**

Southeast U.S.: all bird conservation regions making up the Southeast U.S. Waterbird Conservation Planning Area for Waterbirds of the Americas.

EP (BCR 20): Edwards Plateau (TX)

OP (BCR 21): Oaks and Prairies (TX, OK)

WGCP (BCR 25): West Gulf Coastal Plain-Ouachita Mountains (OK, AR, TX, LA)

MAV (BCR 26): Mississippi Alluvial Valley (IL, MO, KY, TN, MS, AR, LA)

SECP (BCR 27): Southeastern Coastal Plain (KY, TN, LA, MS, AL, FL, GA, SC, NC, VA)

SACP: South Atlantic Coastal Plain (VA, NC, SC, GA, FL east of Apalachicola watershed)

EGCP: East Gulf Coastal Plain (KY, TN, LA, MS, AL, FL west of Apalachicola watershed)

APPS (BCR 28): Appalachians (AL, TN, KY, WV, OH, GA, SC, NC, VA, MD, PA, NY, NJ); many distinct physiographic areas with emphasis

here on the Southern Appalachians including Southern Blue Ridge, Southern Ridge and Valley and Southern Cumberland Plateau, Northern Cumberland Plateau, (less emphasis on Mid Atlantic Ridge and Valley and Allegheny Mountains, and

Ohio Hills). With the exception of Great Blue Heron and Green Heron found throughout this BCR, almost all species treated here when recorded in the Appalachians are mostly restricted to the Southern Ridge and Valley especially along the Tennessee River Valley (AL, TN, GA)

PIED (BCR 29): Piedmont (AL, GA, SC, NC, VA, MD, PA, NJ) with emphasis here on Southern Piedmont (AL, GA, SC, NC)

PENFL (BCR 31); Peninsular Florida (FL)

PENFL: Peninsular Florida, essentially north of Lake Okeechobee (Fort Myers and northward on Gulf side, Fort Lauderdale on Atlantic side)

on to northern extent of black mangrove on both coasts and Florida scrub.

STFL: Subtropical Florida, essentially south from Lake Okeechobee (Fort Myers and Fort Lauderdale) to include Florida Keys, Dry Tortugas

TAMB (BCR 36): Tamaulipan Brushlands (TX, Tam.)

GCP (BCR 37): Gulf Coastal Prairies (LA, TX)

LA: Louisiana including both Deltaic and Chenier Plains

UTX: Upper Texas Coast from Sabine River to East Matagorda Bay

CTX: Central Texas Coast from east Matagorda Bay to Baffin Bay

STX/Tam.: South Texas Coast from Baffin Bay (Tamaulipan Prairies, Laguna Madre, Padre Island) south into Tamaulipas, Mexico.

**PT=Population Trend** based on a combination of data sources, principally BBS tempered by local and state datasets for breeding species. For non-breeding species usually best professional judgment often based in part on continental trends shown in BBS and/or CBC.

5=Definite decrease

4=Possible decrease

3=Trend uncertain, No data

2=Possible increase, stable

1=Definite increase

Some guidelines based on BBS data, but for waterbirds trends are often dramatic and not linear so an inspection of trend graphs often is required to make a judgment as to trend score, again tempered by local and state data sets if they exist.

|   |    |    |
|---|----|----|
| Significant increase (BBS trend $\geq 1.36\%/yr$ , $P \leq 0.10$ , $df > 13$ )                      | 1  |    |
| Possible increase ( $\geq 0.47$ to $1.36\%/yr$ , $P \leq 0.35$ , w/any df)                          | 2a |    |
| Possible increase ( $\geq 1.36\%/yr$ , $0.1 < P \leq 0.35$ , $df > 13$ )                            | 2a |    |
| Possible increase ( $\geq 1.36\%/yr$ , $P \leq 0.10$ , $df < 13$ )                                  |    | 2a |
| Stable ( $> -0.54$ to $< +0.47\%/yr$ , and $UCI < 0.47$ OR $LCI > -0.54$ )                          |    | 2b |
| - except when trend is negative and $P \leq 0.10$ <b>and</b> $LCI < -0.54$ , then Possible decrease |    | 4  |
| Trend uncertain ( $\leq -0.54\%/yr$ or $\geq 0.47\%/yr$ and $P > 0.35$ )                            |    | 3  |
| Trend uncertain ( $> -0.54\%/yr$ and $< 0.47\%/yr$ and $UCI > 0.47$ AND $LCI < -0.54$ )             |    | 3  |
| No data   | 3  |    |
| Possible decrease (either of next 3 options, but based on 6-13 degrees of freedom)                  |    | 4  |
| Possible decrease ( $\leq -0.54$ to $-2.27\%/yr$ , $P = 0.0-0.35$ )                                 |    | 4  |
| Possible decrease ( $\leq -2.27\%/yr$ , $0.1 < P \leq 0.35$ )                                       |    | 4  |
| Significant decrease ( $\leq -2.27\%/yr$ and $P \leq 0.10$ )  |    | 5  |

**PS=Population Size** based on best population estimates globally, most based on Delany and Scott (2002) and Kushlan et al. 2002.

- 5=Rare (<50 thousand breeding individuals globally)
- 4=Uncommon (50-500 thousand breeding individuals globally)
- 3=Fairly Common (500 thousand-5 million breeding individuals globally)
- 2=Common (5 million to 50 million breeding individuals globally)
- 1=Abundant (50 million + breeding individuals globally)

**TB and TN=Threats Breeding and Threats Non-breeding**

- 5=Extreme deterioration in the future suitability of breeding/non-breeding conditions is expected; species is in danger of regional extirpation or major range contraction, or has already been extirpated
- 4=Severe deterioration in the future suitability of breeding/non-breeding conditions is expected
- 3=Slight to moderate decline in the future suitability of breeding/non-breeding conditions is expected
- 2=Expected future conditions for breeding/non-breeding populations are expected to remain stable; no known threats
- 1=Expected future conditions for breeding/non-breeding populations are enhanced by human activities or land-uses; potentially a 'problem' species

## **BD and ND=Breeding Distribution and Non-breeding Distribution**

5=Very Local Distribution (<500,000 km<sup>2</sup>, or very restricted coastal areas or interior uplands)

4=Local Distribution (>500,000 and <1,000,000 km<sup>2</sup>, or <1,600 km of coast)

3=Moderate Distribution (>1,000,000 and <2,000,000 km<sup>2</sup>, or >1,600 to <5,000 km of coast)

2=Widespread (>2,000,000 and <4,000,000 km<sup>2</sup>, or >5,000 to <8,000 km of coast)

1=Very Widespread (>4,000,000 km<sup>2</sup>, or >8,000 km of coast)

## **SUBTOT=Subtotal of six scores (absent AI)**

**AI=Area Importance**, “relative” relative abundance for the species for each area within range scaled against its maximum relative abundance (i.e., the BCR or physiographic area supporting the highest relative abundance)

5=Very High relative abundance (~50+% of maximum relative abundance)

4=High relative abundance (~25-49% of maximum relative abundance)

3=Moderate relative abundance (~10-24% of maximum relative abundance)

2=Low relative abundance (~1-9% of maximum relative abundance)

1=Peripheral, scattered occurrences.

**TOT=Total Score** of all seven factors used for identifying Tiers for which species best fits for conservation planning at Planning Region/Bird Conservation Region/Physiographic Area.

**WL=WatchList** score used for Continental Scoring (PIF Approach); species with WL scores of 14 or more, or with 13 with PT=5 are identified. using formula: Total Continental Score = PT + PS + maximum of (BD or ND) + maximum of (TB or TN)

## **Tier=**

- I. Continental Conservation Interest (Continental WatchList): (a) Species with multiple causes for concern across their entire range; (b) Moderately abundant or widespread species with declines or high threats, and (c) Species with restricted distributions or low population size.

*Species with multiple causes for concern across their entire range:* These species are considered by many to be of highest continental concern and of highest priority for conservation actions at national and international scales.

*Moderately abundant or widespread species with declines or high threats:* These species are on the Watch List primarily because they are declining and/or threatened throughout their range, though still fairly widespread or with moderately large populations.

*Species with restricted distributions or low population size:* These species are on the Watch List because they are restricted to a small range or have small global populations (often both). Many of these species are not known to be declining or seriously threatened at present, but many others. We recognize that these species with small populations and restricted range are particularly vulnerable to relatively minor changes from current conditions, whether or not their populations are currently in decline.

II. Regional Conservation Interest (non-WatchList;  $TOT \geq 19$ ): (a) high regional concern ( $AI+PT \geq 8$ ); (b) high regional threats ( $TB+TN \geq 7$ , or  $TB$  or  $TN=5$ ), (d) taxa (subspecies and populations) of regional conservation interest not otherwise included in categories above; (c) high regional responsibility (as measured by percent of global, continental, or regional populations).

III Additional Federally and/or State listed.

IV Local concern or interest.

**Act. Level=Action Level** at present based on expert opinion, but ultimately rules based on scores would be preferable.

IM=Immediate management needed to reverse or stabilize significant, long-term population declines in species with small populations, or to protect species with the smallest populations for which trends are poorly known. Lack of action may lead to extirpations or extinction.

MA=Management or other on-the-ground conservation actions needed to reverse or stabilize significant, long-term population declines in species that are still relatively abundant.

PR=Long-term Planning and Responsibility needed for species to ensure that sustainable populations are maintained for species for which a region has high responsibility for that species.

PC=Population Control/Suppression needed for species that are otherwise secure and increasing that may come into conflict with other species of higher conservation concern or other resources of interest.

**Per. Resp.: Percent of Responsibility**, that is percent of populations within planning region with respect to global population estimates (Delany and Scott 2002, Kushlan et al.2002) and temperate North America (U.S.-Canada) and within bird conservation region and physiographic area with respect to planning region estimates (based on collective estimates among State waterbird conservation coordinators).

**Est. Pop. Cat. and Pop. Obj. Cat.= estimated population category** is based on collective estimates among state waterbird conservation coordinators and **population objective category** is still under discussion, but regional suggestions are provided.

<sup>1</sup>Key to population categories:

- |  |  |   |
|--|--|---|
| (1) <10 pairs  | (5b) 400>600 pairs<br>(5) 500-1,000 pairs<br>(5a) 900<2,000 pairs              | (9b) 40,000>60,000 pairs<br>(9) 50,000-100,000 pairs<br>(9a) 90,000<200,000 pairs       |
| (2b) 1>20 pairs<br>(2) 10-50 pairs<br>(2a) 40<60 pairs       | (6b) 900>2,000 pairs<br>(6) 1,000-5,000 pairs<br>(6a) 4,000<6,000              | (10b) 90,000>200,000 pairs<br>(10) 100,000-500,000 pairs<br>(10a) 400,000<600,000 pairs |
| (3b) 40>60 pairs<br>(3) 50-100 pairs<br>(3a) 90<200 pairs    | (7b) 4,000>6,000 pairs<br>(7) 5,000-10,000 pairs<br>(7a) 9,000<20,000 pairs    |   |
| (4b) 90>200 pairs<br>(4) 100-500 pairs<br>(4a) 400<600 pairs | (8b) 9,000>20,000 pairs<br>(8) 10,000-50,000 pairs<br>(8a) 40,000<60,000 pairs |   |

## APPENDIX B

### Southeast Region Waterbird Priorities and Habitat Types

Table 1. Southeast U.S. Waterbird Conservation Plan species priorities and habitat suites (b=breeding, r=resident, w=winter, r=resident).\*

| Tier | Tier Title                        | Action Level                | Hérons and allies, Pelicans and allies typically brush and tree nesting colonial waterbirds | Larids typically beach (ground)-nesting colonial waterbirds (terns, gulls, skimmers) | Marshes/ Savannas/ Grasslands | Open water (with mud and sand flats also foraging habitat for most colonial species) | Pelagic (all non-breeding populations) |
|------|-----------------------------------|-----------------------------|---|--|-------------------------------|--|--|
| I.   | Continental Conservation Interest |                             |   |  |                               |  |  |
| a.   | Multiple concerns                 | <i>Immediate management</i> | "Great White" Heron   |  | Black Rail (b/r)              |  | Bermuda Petrel                         |
|      |                                   |                             |   |  | King Rail (b/r)               |  | Black-capped Petrel                    |
|      |                                   |                             |   |  | Yellow Rail (w)               |  |  |
|      |                                   |                             |   |  | Whooping Crane (w-TX, r-FL)   |  |  |
| b.   | High threats and/or declining     | <i>Immediate management</i> |   | Roseate Tern   |                               | Horned Grebe (w)   | Audubon's Shearwater                   |
|      |                                   | <i>Management attention</i> | Little Blue Heron   | Gull-billed Tern   |                               |  | Greater Shearwater                     |
|      |                                   |                             |   | Least Tern   |                               |  | Band-rumped Storm-Petrel               |
|      |                                   |                             |   | Black Skimmer  |                               |  | Bridled Tern                           |

| Tier       | Tier Title                                    | Action Level                           | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
|------------|---|--|---|---|-------------------------------------|--|---|
|            |   | <i>Planning and<br/>responsibility</i> | Masked Booby  |   |                                     |  | Brown Booby                                   |
|            |   |  |   |   |                                     |  | Razorbill                                     |
| <b>c.</b>  | <b>Local and/or<br/>rare</b>                  | <i>Immediate<br/>Management</i>        | Magnificent Frigatebird   |   |                                     |  |   |
|            |   |  | Reddish Egret   |   |                                     |  |   |
|            |   | <i>Management<br/>attention</i>        |   |   |                                     |  | Cory's<br>Shearwater                          |
|            |   |  |   |   |                                     |  | Manx Shearwater                               |
|            |   | <i>Planning and<br/>responsibility</i> |   | Bridled Tern  |                                     |  |   |
| Tier       | Tier Title                                    | Action Level                           | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
| <b>II.</b> | <b>Regional<br/>Conservation<br/>Interest</b> |  |   |   |                                     |  |   |
| <b>a.</b>  | <b>High Concern</b>                           | Immediate<br>Management                | Wood Stork (b/r, FL,<br>GA, SC, AL))  |   | Least Bittern (b/r)                 | Red-throated<br>Loon (w)   | Sooty Shearwater                              |

| Tier      | Tier Title          | Action Level                           | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands                 | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
|-----------|---------------------|--|---|---|---|--|---|
|           |                     | <i>Management<br/>attention</i>        | Green Heron   |   | Purple Gallinule<br>(b/r)                           | Common Tern<br>(transient<br>populations)  |   |
|           |                     |  | Black-crowned Night-<br>Heron   |   | American Coot<br>(breeding<br>populations only)     | Black Tern<br>(transient<br>populations)   |   |
|           |                     |  | Wood Stork (nb, MS,<br>LA, TX, AR, elsewhere)   |   | Limpkin (r)   |  |   |
|           |                     |  |   |   | American Bittern<br>(w)                             |  |   |
|           |                     |  |   |   |   |  |   |
|           |                     | <i>Planning and<br/>responsibility</i> | Yellow-crowned Night-<br>Heron  | Royal Tern  |   |  |   |
|           |                     |  |   | Sandwich Tern   |   |  |   |
| <b>b.</b> | <b>High Threats</b> | <i>Immediate<br/>management</i>        |   |   | Sandhill Crane<br>(Mississippi<br>subspecies)       |  |   |
|           |                     |  |   |   |   |  |   |
|           |                     | <i>Management<br/>attention</i>        | White Ibis  | Common Tern (Atlantic<br>and Gulf coast<br>breeding populations<br>only)                          | Pied-billed Grebe<br>(breeding<br>populations only) | Greater Flamingo<br>(formerly bred)  | Northern Gannet                               |
|           |                     |  |   |   |   | Common Loon<br>(w)   |   |

| Tier        | Tier Title   | Action Level                           | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands                                | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
|-------------|--|--|---|---|--|--|---|
|             |  |  |   |   |  | American White<br>Pelican (w)  |   |
| <b>II.</b>  |  |  |   |   |  |  |   |
| <b>c.</b>   | <b>High<br/>Responsibility</b>                                 | <i>Planning and<br/>responsibility</i> | Brown Pelican   | Forster's Tern (actually<br>nests in marshes)   | Clapper Rail (r)   | Franklin's Gull<br>(transient<br>populations)  | Sooty Tern                                    |
|             |  |  | Tricolored Heron  | Sooty Tern (Florida<br>breeding population<br>only; nests under<br>cover)                         | Sandhill Crane<br>(Florida<br>subspecies)                          | Bonaparte's Gull<br>(w)  | Brown Noddy                                   |
|             |  |  |   | Brown Noddy (Florida<br>breeding population<br>only; elevated nests in<br>shrubs, trees )         | Sandhill Crane<br>(Greater, Lesser,<br>and Canadian<br>subspecies) |  |   |
|             |  |  |   |   |  |  |   |
| <b>III.</b> | <b>Additional<br/>Federal and<br/>State Listed<br/>Species</b> |  |   |   |  |  |   |
|             |  |  |   |   |  |  |   |
| <b>IV.</b>  | <b>Additional local<br/>or regional<br/>interest</b>           | <i>Planning and<br/>responsibility</i> | Anhinga   | Caspian Tern  | Least Grebe (r)  | Eared Grebe (w)  |   |
|             |  |  | Great Blue Heron  |   | Common<br>Moorhen (b/r)  |  |   |

| Tier       | Tier Title  | Action Level                  | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
|------------|---|-------------------------------|---|---|-------------------------------------|--|---|
|            |   |                               | Great Egret   |   | Virginia Rail (w)                   |  |   |
|            |   |                               | Snowy Egret   |   | Sora (w)                            |  |   |
|            |   |                               | Glossy Ibis   |   |                                     |  |   |
|            |   |                               | White-faced Ibis  |   |                                     |  |   |
|            |   |                               | Roseate Spoonbill   |   |                                     |  |   |
|            |   |                               |   |   |                                     |  |   |
| <b>IV.</b> |   | <i>Population<br/>Control</i> | Neotropical Cormorant   | Laughing Gull   |                                     |  |   |
|            |   |                               | Double-crested<br>Cormorant   | Herring Gull  |                                     |  |   |
|            |   |                               | Cattle Egret  | Great Black-backed<br>Gull  |                                     |  |   |
|            |   |                               |   |   |                                     |  |   |
|            | <b>Other species<br/>covered in this<br/>plan</b> |                               |   |   |                                     | Pied-billed Grebe<br>(non-breeding<br>populations)   | Wilson's Storm-<br>Petrel                     |
|            |   |                               |   |   |                                     | American Coot<br>(non-breeding<br>populations)   | Leach's Storm-<br>Petrel                      |
|            |   |                               |   |   |                                     | Ring-billed Gull   | Pomarine Jaeger                               |
|            |   |                               |   |   |                                     | Lesser Black-<br>backed Gull   | Parasitic Jaeger                              |

| Tier | Tier Title | Action Level | Hérons and allies,<br>Pelicans and allies<br>typically brush and<br>tree nesting colonial<br>waterbirds | Larids typically<br>beach (ground)-<br>nesting colonial<br>waterbirds (terns,<br>gulls, skimmers) | Marshes/<br>Savannas/<br>Grasslands | Open water<br>(with mud and<br>sand flats also<br>foraging habitat<br>for most<br>colonial<br>species) | Pelagic (all non-<br>breeding<br>populations) |
|------|------------|--------------|---|---|-------------------------------------|--|---|
|      |            |              |   |   |                                     |  | Black-legged<br>Kittiwake                     |
|      |            |              |   |   |                                     |  | Dovekie                                       |
|      |            |              |   |   |                                     |  |   |

\*See Appendices I-III.

**Tier=**

- I. Continental Conservation Interest (Continental WatchList): (a) Species with multiple causes for concern across their entire range; (b) Moderately abundant or widespread species with declines or high threats, and (c) Species with restricted distributions or low population size.

*Species with multiple causes for concern across their entire range:* These species are considered by many to be of highest continental concern and of highest priority for conservation actions at national and international scales.

*Moderately abundant or widespread species with declines or high threats:* These species are on the Watch List primarily because they are declining and/or threatened throughout their range, though still fairly widespread or with moderately large populations.

*Species with restricted distributions or low population size:* These species are on the Watch List because they are restricted to a small range or have small global populations (often both). Many of these species are not known to be declining or seriously threatened at present, but many others. We recognize that these species with small populations and restricted range are particularly vulnerable to relatively minor changes from current conditions, whether or not their populations are currently in decline.

- II. Regional Conservation Interest (non-WatchList;  $TOT \geq 19$ ): (a) high regional concern ( $AI+PT \geq 8$ ); (b) high regional threats ( $TB+TN \geq 7$ , or  $TB$  or  $TN=5$ ) and includes taxa (subspecies and populations) of regional conservation interest not otherwise included in categories above; (c) high regional responsibility (as measured by percent of global, continental, or regional populations).
- III Additional Federally and/or State listed.
- IV Local or regional concern or interest.

**Act. Level=Action Level** at present based on expert opinion, but ultimately rules based on scores would be preferable.

IM=Immediate management needed to reverse or stabilize significant, long-term population declines in species with small populations, or to protect species with the smallest populations for which trends are poorly known. Lack of action may lead to extirpations or extinction.

MA=Management or other on-the-ground conservation actions needed to reverse or stabilize significant, long-term population declines in species that are still relatively abundant.

PR=Long-term Planning and Responsibility needed for species to ensure that sustainable populations are maintained for species for which a region has high responsibility for that species.

PC=Population Control/Suppression needed for species that are otherwise secure and increasing that may come into conflict with other species of higher conservation concern or other resources of interest.

## APPENDIX C

Wildlife Conservation Commission

### FLORIDA'S ENDANGERED SPECIES, THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

#### *Official Lists*

Publication Date: 1 August 1997

This document consolidates the state and federal official lists of endangered species, threatened species, and other species categorized in some way by the respective jurisdictional agencies as meriting special protection or consideration. The state lists of animals are maintained by the Florida Game and Fresh Water Fish Commission and categorized as endangered, threatened and of special concern, and constitute Rules 39-27.003, 39-27.004 and 39-27.005, respectively, Florida Administrative Code (F.A.C.). The state lists of plants are categorized into endangered, threatened and commercially exploited, and are administered and maintained by the Florida Department of Agriculture and Consumer Services via Chapter 5B-40, F.A.C. The federal lists of animals and plants are administered by the U.S. Fish and Wildlife Service and categorized into endangered and threatened, and are published in 50 CFR 17 (animals) and 50 CFR 23 (plants). The abbreviations used in part one are:

GFC = Florida Fish and Wildlife Conservation Commission

FDA = Florida Department of Agriculture and Consumer Services

FWS = United States Fish and Wildlife Service

E = Endangered

T = Threatened

T(S/A) = Threatened/Similarity of Appearance

T(E/P) = Threatened/Experimental Population

SSC = Species of Special Concern

C = Commercially Exploited

|  |                         | <b>Designated Status</b> |            |
|--|-------------------------|--------------------------|------------|
| <b>Scientific Name</b>                 | <b>Common Name(s)</b>   | <b>GFC</b>               | <b>FWS</b> |
| <b><u>Birds</u></b>                    |                         |                          |            |
| <i>Ajaia ajaja</i>                     | Roseate spoonbill       | SSC                      |            |
| <i>Ammodramus maritimus juncicolus</i> | Wakulla seaside sparrow | SSC                      |            |

|   |                               | Designated Status |     |
|---|-------------------------------|-------------------|-----|
| Scientific Name                             | Common Name(s)                | GFC               | FWS |
| <i>Ammodramus maritimus mirabilis</i>       | Cape Sable seaside sparrow    | E                 | E   |
| <i>Ammodramus maritimus peninsulae</i>      | Scott's seaside sparrow       | SSC               |     |
| <i>Ammodramus savannarum floridanus</i>     | Florida grasshopper sparrow   | E                 |     |
| <i>Aphelocoma coerulescens</i>              | Florida scrub-jay             | T                 | T   |
| <i>Aramus guarana</i>                       | Limpkin                       | SSC               |     |
| <i>Campephilus principalis</i>              | Ivory-billed woodpecker       | E                 | E   |
| <i>Charadrius alexandrinus tenuirostris</i> | Southeastern snowy plover     | T                 |     |
| <i>Charadrius melodus</i>                   | Piping plover                 | T                 | T   |
| <i>Cistothorus palustris griseus</i>        | Worthington's marsh wren      | SSC               |     |
| <i>Cistothorus palustris marianae</i>       | Marian's marsh wren           | SSC               |     |
| <i>Columba leucocephala</i>                 | White-crowned pigeon          | T                 |     |
| <i>Dendroica kirtlandii</i>                 | Kirtland's warbler            | E                 | E   |
| <i>Egretta caerulea</i>                     | Little blue heron             | SSC               |     |
| <i>Egretta rufescens</i>                    | Reddish egret                 | SSC               |     |
| <i>Egretta thula</i>                        | Snowy egret                   | SSC               |     |
| <i>Egretta tricolor</i>                     | Tricolored (=Louisiana) heron | SSC               |     |
| <i>Eudocimus albus</i>                      | White ibis                    | SSC               |     |
| <i>Falco peregrinus tundrius</i>            | Arctic peregrine falcon       | E                 |     |
| <i>Falco sparverius paulus</i>              | Southeastern American kestrel | T                 |     |

| Scientific Name                    | Common Name(s)             | Designated Status |        |
|------------------------------------|----------------------------|-------------------|--------|
|                                    |                            | GFC               | FWS    |
| <i>Grus americana</i>              | Whooping crane             | SSC               | T(E/P) |
| <i>Grus canadensis pratensis</i>   | Florida Sandhill crane     | T                 |        |
| <i>Haematopus palliatus</i>        | American oystercatcher     | SSC               |        |
| <i>Haliaeetus leucocephalus</i>    | Bald eagle                 | T                 | T      |
| <i>Mycteria americana</i>          | Wood stork                 | E                 | E      |
| <i>Pandion haliaetus</i>           | Osprey                     | SSC*              |        |
| <i>Pelecanus occidentalis</i>      | Brown pelican              | SSC               |        |
| <i>Picoides borealis</i>           | Red-cockaded woodpecker    | T                 | E      |
| <i>Polyborus plancus audubonii</i> | Audubon's crested caracara | T                 | T      |
| <i>Rostrhamus sociabilis</i>       | Snail kite                 | E                 | E      |
| <i>Rynchops niger</i>              | Black skimmer              | SSC               |        |
| <i>Speotyto cunicularia</i>        | Burrowing owl              | SSC               |        |
| <i>Sterna antillarum</i>           | Least tern                 | T                 |        |
| <i>Sterna dougallii</i>            | Roseate tern               | T                 | T      |
| <i>Vermivora bachmanii</i>         | Bachman's warbler          | E                 | E      |
| *Applicable in Monroe County only  |                            |                   |        |

## APPENDIX D

### US FISH AND WILDLIFE SERVICE, SPECIES OF CONSERVATION CONCERN IN PENINSULAR FLORIDA (BCR 31)

Black-capped Petrel  
Audubon's Shearwater  
Magnificent Frigatebird  
American Bittern  
Little Blue Heron  
Reddish Egret  
White Ibis  
Swallow-tailed Kite  
Short-tailed Hawk  
American Kestrel (resident *paulus* ssp.  
only)  
*Peregrine Falcon*  
Yellow Rail  
Black Rail  
Limpkin  
Snowy Plover  
Wilson's Plover  
American Oystercatcher  
Whimbrel  
Marbled Godwit  
Red Knot  
Semipalmated Sandpiper  
Stilt Sandpiper  
Buff-breasted Sandpiper  
Short-billed Dowitcher  
Gull-billed Tern  
Common Tern  
Least Tern  
Black Tern  
Black Skimmer  
White-crowned Pigeon  
Common Ground-Dove  
Mangrove Cuckoo  
Smooth-billed Ani  
Burrowing Owl  
Chuck-will's-widow  
Red-headed Woodpecker  
Loggerhead Shrike  
Black-whiskered Vireo  
Brown-headed Nuthatch  
Yellow Warbler (resident *gundlachi* ssp.  
only)  
Yellow-throated Warbler  
Prairie Warbler  
Bachman's Sparrow  
Henslow's Sparrow  
Nelson's Sharp-tailed Sparrow  
Saltmarsh Sharp-tailed Sparrow  
Seaside Sparrow