FINAL DRAFT

Avian Conservation Implementation Plan
Moores Creek National Battlefield

National Park Service
Southeast Region



Compiled by J. Keith Watson
U.S. Fish and Wildlife Service
In cooperation with

MOCR 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 Moores Creek National Battlefield (MOCR) 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 allowing 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 MOCR is largely an upland landscape, recommendations will be derived mainly from the existing PIF Southeast Coastal Plain bird conservation plan. However, all high priority bird conservation issues for MOCR will be discussed and integrated as appropriate.

Information and data presented in the ACIP have been obtained from several sources: 1) interviews with MOCR staff, 2) MOCR bird conservation partners, 3) the PIF South Atlantic Coastal Plain Bird Conservation Plan, Version 1.0 (Hunter et al. 2001), 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 MOCR resource management staff and managers, Southeast Coast Network Inventory and Monitoring (SEC I&M) staff, and bird conservation partners and approved by MOCR management. Optimally, this plan will be incorporated into the park's Resource Management Plan (RMP) and updated annually to reflect completed projects, newly identified needs, and shifts in bird conservation priorities in the region.

MOCR is not obligated to undertake any of the proposed actions in this plan. The plan is provided to offer guidance to MOCR to voluntarily support important park, regional, and perhaps national and international bird conservation projects for which MOCR 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). 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 among 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 (ACIP),
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 MOCR and with adjacent partners or landowners.

Concurrently, the development of a Memorandum of Understanding (MOU) between the FWS and the NPS to implement Presidential Executive Order (EO) 13186 (US Government 2000), Responsibilities of Federal Agencies To Protect Migratory Birds, 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 (March 2000), a visionary document developed and signed by the Southeast Natural Resource Leaders Advisory Group (SENRLAG), 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 Polices (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 33.6 million ha (83 million acres) of land and water with associated biotic resources (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, Everglades 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 Globally Important 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 US 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

MOCR is located in an area of second growth forest interspersed with small farms. Woodland is harvested for the pulp industry. Presently, no significant industrial, commercial, or residential developments exist near the park. The topography of the region is relatively flat. A short distance within the park, the higher land characteristic of the inland Carolina coastal plain descends abruptly to the lowlands that comprise the

greater portion of the park land, reaching to Moores Creek. This freshwater stream, averaging 30 feet in width, forms the western boundary of the park. Bordering the park are screens of dense second-growth vegetation, while the landscape at the center of the development consists of grass-covered meadows and slopes with scattered trees and brush. Habitats include alluvial woods, old fields, ditches, sandy xeric woods, lawns, a pond, pinewoods, mixed wooded slopes, creek banks, roadside ditches and meadows (USDI NPS 2000).

Several potential threats to MOCR resources have been noted. Although the park is fairly isolated, residential development on adjacent lands has been increasing in recent years. Past landscape practices at the Battlefield have likely impacted several locally rare and/or state-listed plant species. Efforts to restore habitat for these species is currently underway, although long-term monitoring is necessary to fine-tune efforts and ensure their eventual success. Finally, the predominant tree species, loblolly pine, is greatly affected by pine bark beetle. Long-term efforts are underway to restore the beetle-resistant, native Longleaf pine across much of the Battlefield (USDI NPS 2000).

Avian Resources of South Atlantic Coastal Plain

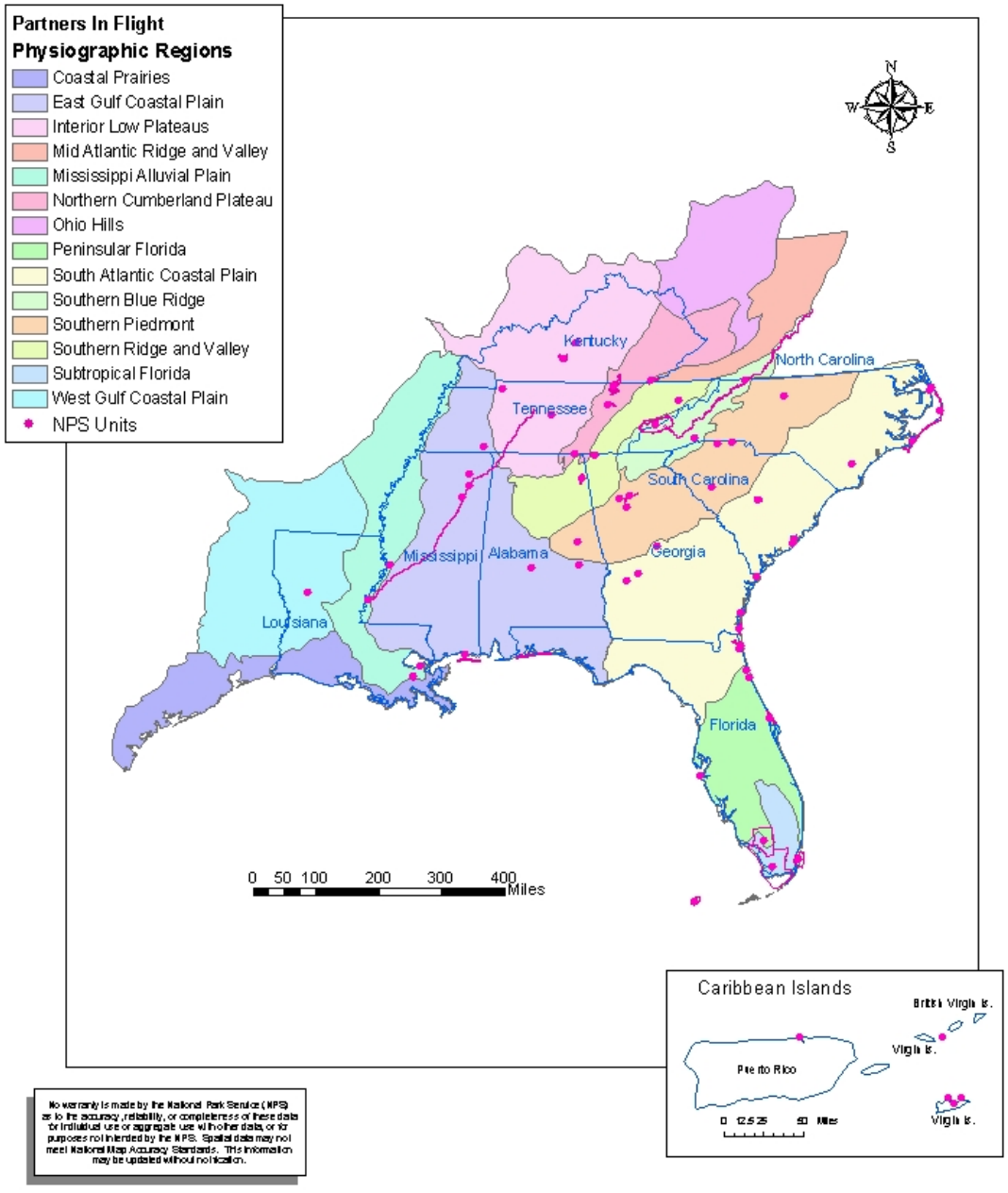
The South Atlantic Coastal Plain, consisting of about 10,121,457 million ha (4 million acres), includes parts of Virginia, North Carolina, South Carolina, Georgia, Alabama and Florida (see PIF and NPS location maps below). This physiographic area is one of four coastal plain divisions recognized by Partners in Flight. Although these coastal plain areas share many conservation issues, differences in key species and habitats exist. For instance, the South Atlantic Coastal Plain includes (1) the largest forested floodplains outside of the Mississippi Alluvial Plain, (2) unique non-alluvial wetlands (Dismal Swamp, pocosins, Carolina Bays, Okefenokee Swamp), (3) the largest remnants of the former longleaf pine dominated ecosystems (especially flatwoods and sandhills, and to a lesser extent savannas), (4) the best remaining examples of "natural" barrier and sea islands and maritime forests in the Southeast, and (5) biologically rich Apalachicola Bluff forests. Also present within this physiographic area are extensive tidal wetlands and commercial forests. Physical characteristics include a predominantly flat, weakly dissected alluvial plain with active fluvial deposition and shore zone processes along coastlines. Elevation ranges from 0 feet increasing towards the fall line to 600 feet. Major blackwater rivers (with headwaters in the coastal plain) include Chowan, Waccamaw, Satilla, St. Mary's, Suwanee, and St. John's (originating in Peninsular Florida). Major brownwater rivers (with headwaters originating in the Southern Piedmont or Southern Blue Ridge) include Roanoke, Tar, Neuse, Cape Fear, Pee Dee, Santee-Cooper, Ashepoo-Combahee-Edisto (ACE), Savannah, Ogeechee, Altamaha, and Apalachicola (Chattahoochee and Flint). Average annual precipitation is 40-60 inches except on the Florida Gulf Coast where it is 52-64 inches.

Land conversion for both agricultural and urban expansion has resulted in a 40 percent loss of natural vegetation (closer to 65 percent along some coastlines) in this physiographic area. Potential natural vegetation (i.e., absent frequent disturbances) is

Partners in Flight (PIF) Regions

Southeast Region (SER)

National Park Service
U.S. Department of the Interior



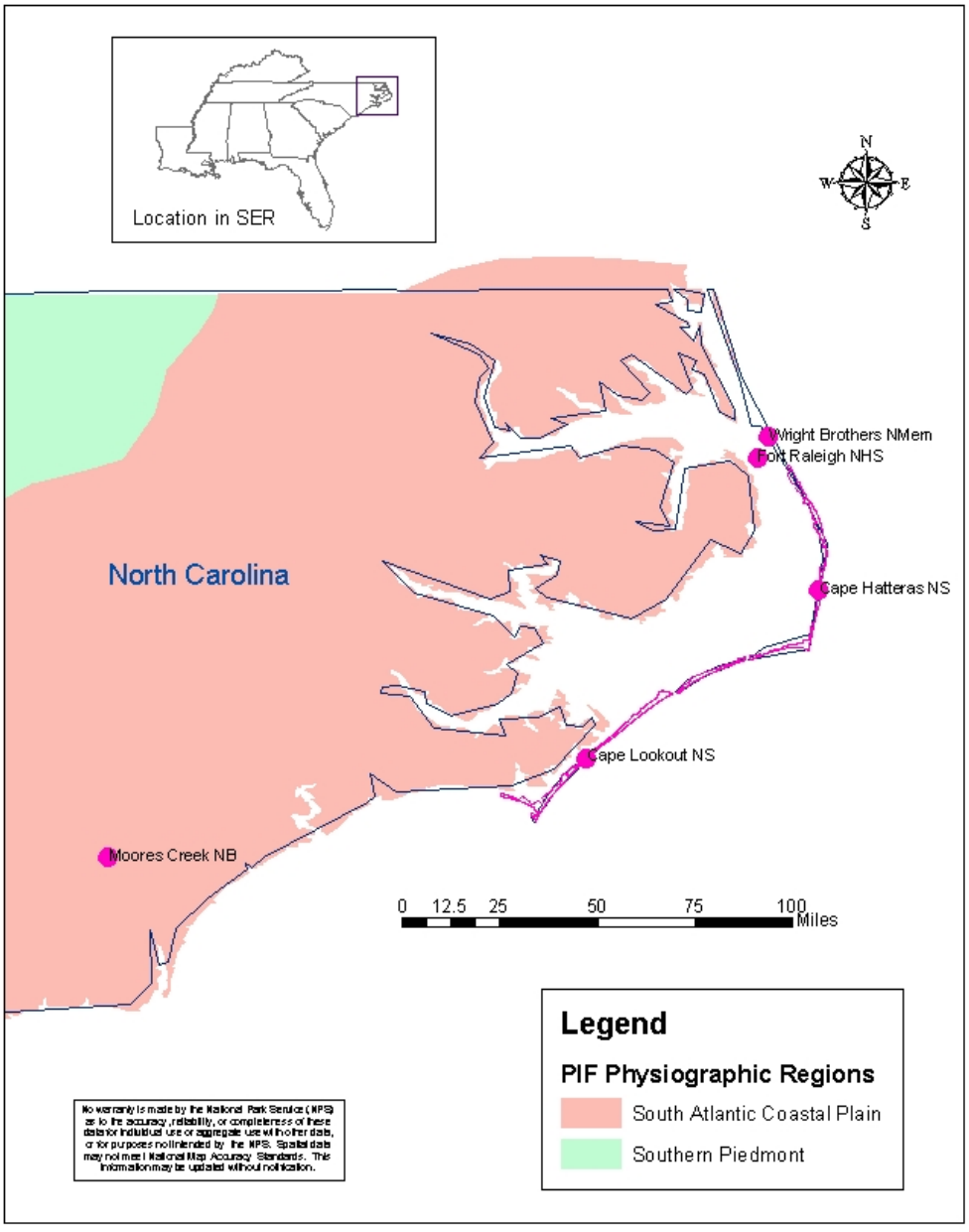
Produced by Southeast Regional Office GIS, Atlanta, GA

March 2004

Partners in Flight (PIF) Regions and NPS Locations

Southeast Region

National Park Service
U.S. Department of the Interior



Produced by Southeast Regional Office GIS, Atlanta, GA

February 2004

referred to as "southern mixed" forests and oak/hickory/pine, with intervening southern floodplain forest and pocosins, as well as live oak/sea oats along coastlines. However, disturbances are frequent and therefore, upland forests historically were characterized by open pine (predominantly longleaf) forests. Today, predominant vegetation remains slash (Florida) and longleaf pines, with loblolly pine becoming common nearer to the Southern Piedmont and the northern portions of this physiographic area. Oak/gum/cypress forest cover type is common along floodplains and prevalent species include laurel oak, water tupelo, swamp tupelo, swamp chestnut oak, cherrybark oak, and baldcypress. Pond pine and Atlantic white cedar become important within the Lower Coastal Plain, especially in pocosin and other non-alluvial wetland types. Live oak becomes important along coastal areas and frequently is included with other coastal pines and hardwoods in various types of "hammocks."

Within the South Atlantic Coastal Plain, fire is the single most important driving disturbance force. Natural burns occur over medium to large size areas between natural barriers (e.g., floodplains, other wetlands) with moderate frequency and low intensity. Fires most often occurred during the growing season, in many cases started by lightning, and were essential for supporting numerous plant communities and dependent animals, including many bird species. In addition to fire, hurricanes, tornadoes, and floods are frequent as disturbance agents. Ice storms, though rare, are devastating where they occur. Finally, southern pine beetles are important disturbance agents.

Conservation issues within the South Atlantic Coastal Plain include:

(1) management and conservation of forested floodplains and related wintering waterfowl and migratory landbird needs;

(2) monitoring and protection of colonially nesting terns and skimmers, as well as vulnerable shorebirds, especially in areas with increased human disturbance and habitat loss;

(3) research and protection of Wood Storks and White Ibises;

(4) conservation of nongame waterbird habitats (under the purview of other bird conservation groups such as the Western Hemispheric Shorebird Reserve Network, Waterbird Society, North American Waterfowl Management Plan, and the International Association of Fish and Wildlife Agencies' Migratory Shore and Upland Gamebird Subcommittees);

(5) best management practices for forested wetlands, maritime communities, southern pine forests, and upland hardwood (including riparian) forests; and

(6) conservation and protection of vulnerable Nearctic-Neotropical migratory landbirds.

Over 300 bird species occur annually in the South Atlantic Coastal plain as nesting, post nesting dispersers, transients, and /or wintering residents. Among these species, the South Atlantic Coastal Plain supports critically important populations for a number of extremely high priority bird species. Species in need of the greatest conservation attention include Henslow's Sparrow, Wood Stork, Bachman's Sparrow, Swallow-tailed Kite, Swainson's Warbler, Eastern Painted Bunting, Black-capped and Bermuda Petrels, Red-cockaded Woodpecker, Southeastern American Kestrel, Wayne's Black-throated Green Warbler, Saltmarsh Sharp-tailed Sparrow, Red Knot, Piping Plover, and Snowy Plover (Gulf Coast). Other priority species also of conservation interest include Florida Sandhill Crane, White Ibis, Loggerhead Shrike, Cerulean Warbler, Prothonotary Warbler, Seaside Sparrow, Brown-headed Nuthatch, American Woodcock, Northern Bobwhite, Common Ground-Dove, Yellow-throated Warbler, Rusty Blackbird, Black Skimmer, Least Tern, Black Rail, Peregrine Falcon, Bald Eagle, American Oystercatcher, Red-throated Loon, and most migrating and wintering shorebirds and rails, Brant, American Black Duck, Lesser and Greater Scaup, Tundra Swan, and Wood Duck.

Conservation objectives for the South Atlantic Coastal Plain revolve mostly around (1) stabilizing or increasing populations of high priority breeding bird species, (2) wintering species, (3) and increasing the quality and availability of stopover habitat for transient species. Although waterbirds are treated here, these species groups are mostly the subjects of other planning efforts. For landbird species, the primary habitat objectives proposed in this plan include the following:

1. Retain and restore 526,000 ha (1.3 million acres) of native warm season grass habitats, with as much associated with longleaf pine as feasible.

2. Provide at least 121,457 ha (300,000 acres) of 5 -year idle lands, 121,457 has (300,000 acres) of annuals, and 245,000 ha (600,000 acres) of 10-20 year idle lands.

3. Maintain and improve the habitat quality of 8 forested wetland sites for Swallow-tailed Kite, maintain and stabilize at least 1 forested wetland site for Cerulean Warbler, at least 10 sites for Wayne's Black-throated Green Warbler, and 30 sites for Swainson's Warblers, which requires 10 patches over 40,485 ha (100,000 acres), 15 patches over 8,100 ha (20,000 acres), 7 patches over 4,050 ha (10,000 acres), and 30 patches over 2,400 ha (6,000 acres).

4. Protect 100% of remaining maritime communities and increase acreage wherever restoration is possible.

5. Increase longleaf pine forest acreage from 607,300 ha (1.5 million acres) to over 890,700 ha (2.2 million acres) and improve conditions favoring warm-season grassy ground cover, on at least 263,157 ha (650,000 acres) by year 2025.

Avian Conservation in MOCR

Avian Biodiversity: MOCR does have an avian inventory, but is considered incomplete according to NPS I&M goals. A checklist is available but needs to be updated.

Verified records of birds in MOCR 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: Over 105 species of birds have been documented in MOCR. The park is in the process of updating inventory and verifying existing records.

Threatened and Endangered Species: No known Federally listed threatened or endangered species are known to occur in MOCR.

Cooper's Hawk and White Ibis occur in the park and are on the North Carolina Natural Heritage Program Rare Birds occur in MOCR. Several other North Carolina rare birds occur in the parkas winter residents include Blue-winged Teal, Sharp-shinned Hawk, Hermit Thrush, Brown Creeper, and Yellow-rumped Warbler.

Additional high priority PIF species for the South Atlantic Coastal Plain occur in MOCR and include American Woodcock, Brown-headed Nuthatch, Wood Thrush, Northern Parula, Hooded Warbler, Veery, Yellow-throated Warbler, Prairie Warbler, Field Sparrow, Northern Bobwhite, Yellow-billed Cuckoo, Eastern Towhee, Prothonotary Warbler, Acadian Flycatcher, and White-eyed Vireo.

Monitoring: Currently, no avian monitoring is being conducted at MOCR.

Research: Scientific research is permitted within the park but no avian research is currently being conducted at MOCR.

Outreach: No educational/outreach programs are being conducted at MOCR.

Park Identified Needs for Avian Conservation

MOCR has identified the need to complete the avian inventory.

Coordination with Regional Conservation Initiatives

The 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, MOCR is within the NABCI Southeastern Coastal Plain BCR which extends from

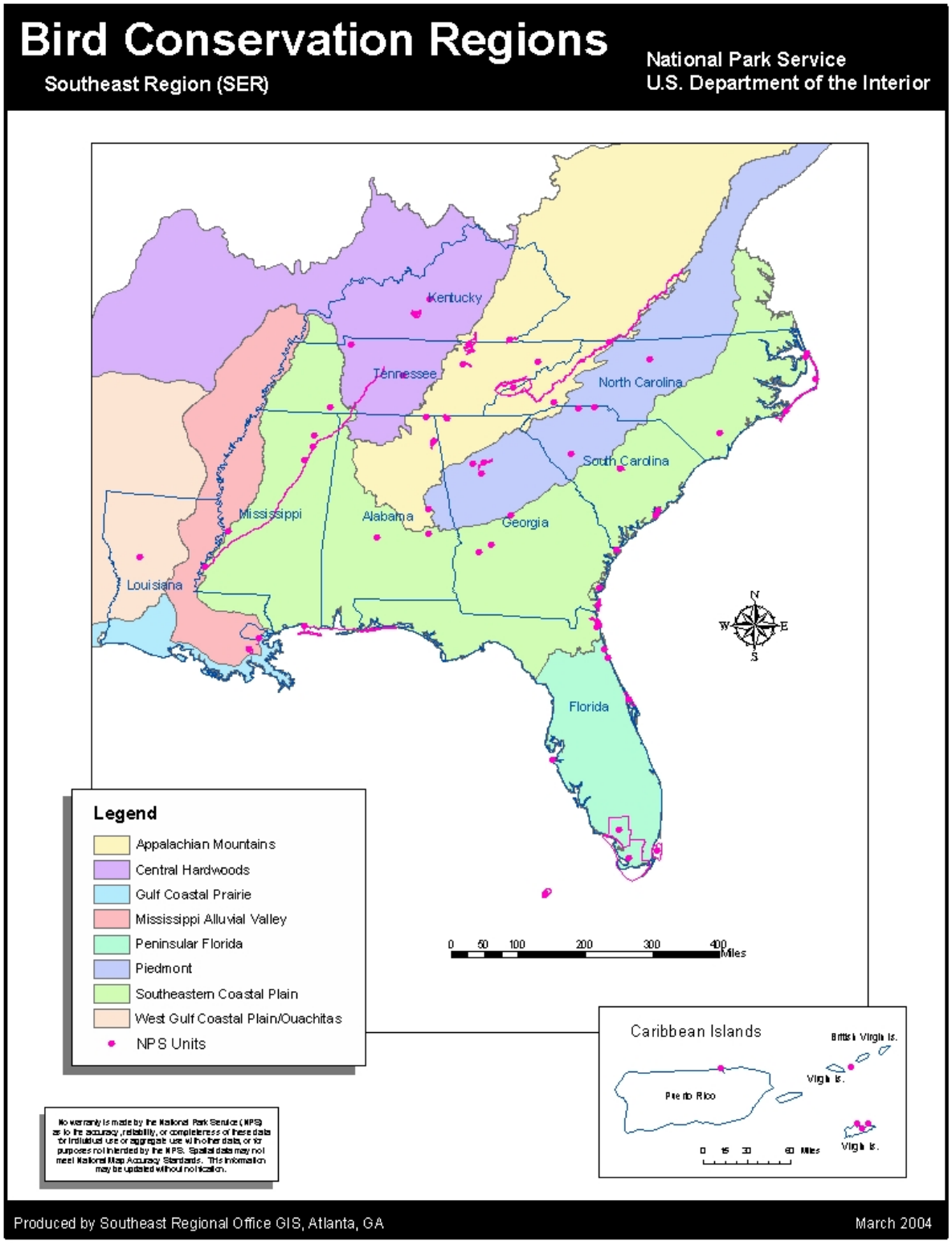
Virginia south to northern Florida and west to Louisiana north to western Kentucky, following the Atlantic and Gulf coastal plains (see NABCI BCR map below) and encompasses several PIF physiographic areas (the planning unit for PIF)(compare to PIF map).

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 Southeastern Coastal Plain does not have a designated coordinator; however, a large portion of the BCR lies within the Atlantic Coast Joint Venture area (Maine to Florida and includes Puerto Rico) and the ACJV has several professional bird conservationists base throughout the region to assist partners in bird conservation efforts (see contacts below). This staff can provide valuable assistance to MOCR 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) and focused primarily on wetland and waterfowl protection, but increasingly these funds have also been utilized for upland non-game species protection. MOCR has several needs that could be funded by NAWCA.

Partners In Flight: Goals and strategies for the South Atlantic Coastal Plain (SACP) can be found in the draft bird conservation plan, previously submitted to the park. The current plan identifies priority bird and habitat conservation goals that must be implemented in order to achieve bird conservation success in this region. MOCR being a barrier island park with all major bird groups represented will to utilize all the bird conservation initiative plans. Since shorebird and colonial waterbird plans have not been developed on a regional basis, and the SACP plan covers these species, many of the recommendations in this plan will be derived from the SACP priorities.

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 North Carolina does have a PIF coordinator and can be instrumental in assisting MOCR to implement recommendations identified in this ACIP and projects important to bird conservation relative to North Carolina's role in implementation of the SACP plan.


Bird Conservation Regions
Southeast Region (SER)
National Park Service
U.S. Department of the Interior
Kentucky
Tennessee
North Carolina
South Carolina
Mississippi
Alabama
Georgia
Louisiana
Florida
N
W
E
S
0 50 100 200 300 400 Miles
Legend
Appalachian Mountains
Central Hardwoods
Gulf Coastal Prairie
Mississippi Alluvial Valley
Peninsular Florida
Piedmont
Southeastern Coastal Plain
West Gulf Coastal Plain/Ouachitas
NPS Units
No warranty is made by the National Park Service (NPS) as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the NPS. Spatial data may not meet National Map Accuracy Standards. This information may be updated without notification.
Caribbean Islands
British Virgin Is.
Virgin Is.
Puerto Rico
Virgin Is.
0 15 30 60 Miles
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March 2004

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 2004. The developing regional shorebird plan will be important for MOCR since many of MOCR's avian resources are related to its shoreline and shorebird use, primarily during migration and winter.

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/). A regional step down plan is in preparation by FWS personnel and should be available in 2003. The developing regional colonial waterbird plan will be important for MOCR since MOCR is a primary nesting site for colonial waterbirds in North Carolina, and the east coast.

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 the 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, participation in these efforts at

some level could become mandatory with the completion of an MOU with the FWS regarding EO 13186 (US Government 2000), Responsibilities of Federal Agencies to Protect Migratory Birds. The MOU will establish a formal agreement between the FWS and the NPS 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 is in the process of completing inventory. Several high priority species for conservation occur in the park and additional species will likely be identified following the inventory. Information regarding the status of high priority species (as identified in the South Atlantic Coastal Plain bird conservation plan, the North Carolina Watch List, and the USFWS Species of Conservation Concern) is needed to effectively structure park management for the continued preservation and enhancement of the park's avifauna and habitats.

MOCR is encouraged to:

- **determine distribution and abundance of high priority species as identified in the South Atlantic Coastal Plain bird conservation plan***

- **verify other avian observational data collected in the park and enter into the appropriate database (NPSpecies, National Point Count Database, ebird(Cornell Laboratory of Ornithology; http://www.ebird.org/about/index.jsp)***

- **standardize inventory methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000; Hunter 2000)**

Monitoring: The park does not have an active bird monitoring program. Appropriate monitoring programs should be considered for high priority species identified in the inventory. Coordination with the Atlantic Coast Joint Venture Coordinator and North Carolina Wildlife Resources Commission staff is needed to further identify and implement high priority projects on park lands 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:

- **work with Lower Cape Fear Bird Club (http://people.uncw.edu.emslies/CFbirdclub) to establish a Christmas Bird Count that includes the park**

- **consider establishing permanent monitoring stations in main habitat types to collect baseline data, with emphasis on priority species. This information will be useful for documented potential changes in park avifauna resulting from habitat change or management activities. Links to literature detailing inventory and monitoring methodologies for various avian groups (e.g. songbirds, shorebirds, raptors, etc.) can be found at: http://biology.dbs.umt.edu/landbird/mbcp/groups.htm**

- **standardize monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000; Hunter 2000)**

Habitat Restoration: Landscape conditions in the Southeastern US have changed dramatically since early European explorers began documenting the area, its habitats, and its inhabitants. Historic landscapes were influenced by Native American burning, wildfire, bison, beaver, and elk, as well as by insect outbreaks and weather events (Hunter et al. 2001, Williams 2002), thus resulting in a landscape mosaic that supported a rich and diverse bird fauna in the Southeast (Barden 1997; Brawn et al. 2001). The arrival of Europeans and the subsequent change in landscape has dramatically effected bird habitat and bird populations. Bird conservationists have long recognized that habitat restoration is critical to restoration of bird populations, stabilizing or reversing bird declines, and removing birds from both State and Federal Threatened and Endangered Species lists. This is no exception for MOCR.

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 MOCR 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 are subject to a wide variety of threats, both inside and outside of the park, and habitats 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 for the

enjoyment of future generations. Protection, restoration, and enhancement of habitats in MOCR can greatly contribute to established habitat goals identified in the South Atlantic Coastal Plain bird conservation plan and regional shorebird and colonial waterbird conservation plans.

The park is a mixed habitat of upland hardwoods, mixed pine hardwood habitat, cultivated grass fields, shrub-scrub, and riparian areas, an amazingly rich landscape for a small area. Much of this habitat provides suitable area and vegetative cover for nesting landbirds, but could be improved through restoration of habitats present at the time of the battle and use of prescribed fire to maintain these habitats. Specific recommendations are to:

- **restore landscape conditions to that at the time of the Battle of Moores Creek Bridge, creating woodland savannah habitats in both hardwood and Longleaf Pine forest***

- **restore Longleaf Pine/Wiregrass community**

- **maintain and manage other forested acreage to old growth conditions, implementing management techniques to create structural complexity needed for high priority species in these areas***

- **convert cold season battlefield grasslands to native warm season grasses***

- **consider use of prescribed fire to restore forest structure and grasslands and development of savanna habitat***

- **contact Natural Resource Conservation Service (NRCS) conservationists to develop program of land protection and conservation on private lands adjacent to the park***

- **protect existing snag trees, where not identified as a safety hazard, as important to cavity nesting birds***

- **document all major habitat management activities, including the 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: No significant threats to birds have been identified at MOCR. However, development outside the boundary and resulting forest fragmentation may potentially affect avian success in the area. The park is encouraged to:

- **work with the local community and other land conservation interests in the region to minimize habitat fragmentation and potentially restore habitats beneficial to wildlife and bird species of the region (for undeveloped adjacent lands, contact NRCS***

- **consult with the regional pest management specialist (see contacts) to establish an exotic plant management program***

Research

- **list park needs and projects on Research Permit and Reporting System web site (RPRS)**

- develop contact with Cooperative Ecosystem Studies Unit (CESU) at the University of Georgia, Athens, GA

Compliance: Park compliance with the Migratory Bird Treaty Act and the Executive Order 13186 (US Government 2000), Responsibilities of Federal Agencies to Protect Migratory Birds, 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. Compliance considerations for the park are for:

- **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

- **update the inventory and checklist for the public**

- **encourage accurate documentation and reporting of bird observations by visitors (see Cornell University's eBird monitoring program (Cornell Lab. Ornith. 2002 (http://www.ebird.org/about/index.jsp)**

- **offer a bird field guide in the visitor center**

- **develop and strengthen relationship with Lower Cape Fear Bird Club for potential cooperation and implementation of segments of this plan***

- **support bird conservation by serving shade-grown coffees at meetings, events, and the office buildings in the park** (http://www.americanbirding.org/programs/conssbcof3.htm)

- park interpretation/education staff are encouraged to attend USFWS training on Migratory Bird Education at NCTC

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

- **continue to keep abreast of local initiatives or programs that could impact park resources***

- **contact NRCS private lands biologists to discuss private landowner initiatives applicable to the area and develop land use agreements with local landowners***

- **develop and strengthen relationship with Lower Cape Fear Bird Club for potential cooperation and implementation of segments of this plan***

- **develop partnerships with North Carolina Wildlife Resources Commission to develop cooperative projects for bird conservation**

- **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 South Atlantic Coastal Plain bird conservation plan**

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. MOCR is encouraged to enter all high priority projects into the NPS Performance Management Information System (PMIS) database.

Funding for conservation projects for Neotropical migrants is also available through the Park Flight program. Needed at MOCR 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. The Atlantic Coast Joint Venture is very active in bird conservation in the South Atlantic Coastal Plain and are a primary contact for potential funding (http://northeast.fws.gov/migratorybirds/acjv.htm). Additional 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.

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. MOCR is encouraged to become a member of the Roanoke-Tar-Neuse-Cape Fear Ecosystem Team of the US Fish and Wildlife Service.

One unexplored yet potentially fruitful funding source for national parks is the myriad of grants through the FWS State Programs, where grants are awarded to private individuals engaged in habitat conservation projects. No funding is directly available to

national parks, but identified projects with important or critical adjacent landowners can sometimes be funded through these sources. Similar programs are available if the adjacent landowner is a federally recognized American Indian tribe.

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 2004, appropriation was approximately $4 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. Additional contacts include:

Craig Watson Atlantic Coast Joint Venture Charleston, SC 843-727-4707 ext. 16 Craig_Watson@fws.gov	Linda Brown Moores Creek National Battlefield 910-283-5591 Linda_Brown@nps.gov
Keith Watson Appalachian Mountains BCR Coordinator Asheville, NC 28801 828-350-8228 Keith_Watson@fws.gov	Joe DeVivo Southeast Coast Network Coordinator 404 562-3113 x739 Joe_DeVivo@nps.gov
Chuck Hunter Regional Refuge Biologist Atlanta, GA 404-679-7130 Chuck_Hunter@fws.gov	Walker Golder North Carolina Audubon (910) 798-8376 **wgolder@audubon.org**
Dean Demarest US Fish and Wildlife Service 1875 Century Blvd. Atlanta, GA 404-679-7371 dean_demarest@fws.gov	Mark E. Johns North Carolina Wildlife Resources Commission Partners In Flight Biologist 919-852-5124 johnsme@mindspring.com
Chris Furqueron Exotic Plant Management 404-562-3113 ext 540 Chris_Furqueron@nps.gov	David Allen North Carolina Wildlife Resources Commission Coastal Faunal Diversity Supervisor Trenton, NC 252-488-1546 allend@coastalnet.com
Ann Childress Moores Creek National Battlefield 910-283-5591 Ann_Childress@nps.gov	Steve Emslie Lower Cape Fear Bird Club 910-962-3357 **emsliest@yahoo.com**

Jon F. Heisterberg USDA APHIS Wildlife Services North Carolina 919-786-4480 jon.f.heisterberg@aphis.usda.gov	Adrian Moon District Conservationist 910-259-4305 Adrian.Moon@nc.usda.gov

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APPENDIX A

HIGH PRIORITY SPECIES IN THE SOUTH ATLANTIC COASTAL PLAIN BIRD CONSERVATION REGION

(From Hunter et al. 2001, Table 1. Priority bird species for South Atlantic Coastal Plain:

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
Ia.	Bewick's Wren Appalachian	35	5	5		C	Nearly extinct
	Kirtland's Warbler[5]	35	5	5		A	Mostly SC, GA
	Black-capped Petrel	32	5	5		P	Concentrations off NC
	Bermuda Petrel[5]	32	2	5		P	Increasingly regular off NC
	Red Knot South Atlantic	32	5	5		C	Mostly GA, FL
	Red-cockaded Woodpecker[5]	32	5	4	80.4*	R	
	Snowy Plover Southeast	31	3	5		D	St. Joseph Peninsula to Dog Island, FL Gulf
	Painted Bunting Eastern	31	5	5		B	GA, SC, n. FL, se NC
	Roseate Tern[5] North American	30	3	4		A	Highly Pelagic
	Black-throated Green Warbler Wayne's (Coastal)	30	5	4	100.0*	B	VA, NC, SC
	Bachman's Sparrow	30	5	5	36.6*	R	Primarily breeding
	Saltmarsh Sharp-tailed Sparrow	30	5	3		C	
	Wood Stork[5] Southeast	29	4	4	44.3?	D	FL, GA, se SC
	Henslow's Sparrow	29	5	4		D	Winters FL, GA, SC(?), breeding ne NC, se VA
	Swallow-tailed Kite North American	28	4	3	10.8	B	SC, GA, FL
	American Kestrel Southeastern	28	5	4		D	

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
	Piping Plover[5]	28	4	4		D	Mostly winter, breeding NC, possibly SC
	American Oystercatcher North American	28	5	3		D	
Ib.	Short-tailed Hawk Florida	27	2	3		B	St. Marks to Lower Suwannee, FL
	Black Rail	27	4	4		D	
	Sandhill Crane Florida	27	3	3		R	FL, GA
	Brown-headed Nuthatch	27	5	5	38.7*	R	
	Nelson's Sharp-tailed Sparrow	27	3	3		C	
	Audubon's Shearwater Caribbean	26	5	3		P	
	Yellow Rail	26	4	3		C	
	Wilson's Plover	26	4	3		D	Mostly breeds, irregular in winter in GA, FL
	Bicknell's Thrush	26	5	3		A	
	Swainson's Warbler	26	4	1	15.9	B	
	Seaside Sparrow	26	5	3		D	Atl. and Gulf pops. may represent full species
	Whimbrel	25	5	5		A	
	Buff-breasted Sandpiper	25	3	4		A	
	Black-throated Blue Warbler	25	5	3		A	
	Cerulean Warbler	25	2	3		B	Roanoke River, NC; elsewhere?
	Brown Pelican Southeast	24	5	1		R	
	Marbled Godwit	24	3	4		C	
	Bobolink	24	5	5		A	
	Buff-breasted Sandpiper	24	3	3		A	
	Brant	23	3	5		C	Mostly NC
	King Rail	23	5	4		D	

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
	Sandhill Crane Greater	23	5	3		C	FL, GA
Ib (cont.).	White Ibis	23	5	4[4]		D	
	Stilt Sandpiper	23	4	5		A	
	Solitary Sandpiper	23	5	3		A	
	American Woodcock	23	5	4		D	Mostly winter, some breeding
	Wood Thrush	23	3	5	8.5*	B	
	Northern Parula	23	5	5	23.7*	B	
	Cape May Warbler	23	5	3		A	
	Worm-eating Warbler	23	3	2	14.7	B	
	Connecticut Warbler	23	5	3		A	
	Hooded Warbler	23	4	4	15.0*	B	
	Cory's Shearwater	22	5	3		P	
	White Ibis	22	4	4	15.7?	D	
	American Black Duck	22	3	5		D	Breeds VA, NC; formerly wintered to GA
	Clapper Rail	22	5	3		D	
	Semipalmated Sandpiper	22	5	5		A	
	Purple Sandpiper	22	4	2		C	
	Short-billed Dowitcher	22	5	5		A	Many winter
	Short-eared Owl	22	3	5		C	
	Black Tern	22	5	5		A	
	Sedge Wren	22	4	2		C	
	Veery	22	5	5		A	
	Yellow-throated Warbler	22	4	3	25.5*	D	Mostly breeding, some winter coastal GA, ne FL
	Prairie Warbler	22	3	4	17.9*	B	
	Bay-breasted Warbler	22	3	3		A	
	Louisiana Waterthrush	22	4	2	8.1	B	
	Field Sparrow	22	5	5		D	Primarily winter
	Le Conte's Sparrow	22	3	2		C	Mostly GA, SC

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
IIa.	American Bittern	21	4	5		D	Most wintering, local breeding
	Canvasback	21	4	4		C	
	Northern Bobwhite	21	4	5		R	
	Black-bellied Plover	21	4	5		A	Many winter
	Willet	21	5	3		D	
	Ruddy Turnstone	21	5	5		A	Many winter
	Sanderling	21	5	5		A	Many winter
	Western Sandpiper	21	5	3		A	Many winter
	Gull-billed Tern	21	5	4	11.5?	D	
	Least Tern	21	5	5		B	
	Black Skimmer	21	4	5		D	
	Yellow-billed Cuckoo	21	4	5		B	
	Black-throated Green Warbler (all, including Wayne′s)	21	5	3		A	
	Grasshopper Sparrow	21	5	5		D	Primarily migration, some breeding and wintering
	Least Bittern	20	5	3		B	
	Lesser Scaup	20	5	5		C	
	Black Scoter	20	4	5		C	
	Northern Harrier	20	4	4		C	
	American Avocet	20	3	3		C	
	Least Sandpiper	20	5	5		A	
	Dunlin	20	4	5			C
	Sandwich Tern	20	5	3		B	
	Common Ground-Dove	20	3	5	17.6?	R	FL to se SC
	Palm Warbler	20	3	5		C	
	Eastern Towhee	20	5	5	24.5*	D	

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score		Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
			Area Importance	Population Trend			
IIb (cont.).	Red-throated Loon	19	5	4		C	Major concentrations from Back Bay, VA, to Cape Fear, NC, uncommon to rare elsewhere
	Common Loon	19	5	3		C	
	Greater Scaup	19	3	5		C	
	Greater Yellowlegs	19	5	3		A	Some winter
	Pectoral Sandpiper	19	5	3		A	
	Royal Tern	19	5	3	30.6?	D	
	Barn Owl	19	5	3		D	
	Least Flycatcher	19	3	5		A	
	Carolina Chickadee	19	4	4	11.4	R	
	Rusty Blackbird	19	3	5		C	
IIb.	Chuck-will's-widow	21	5	2	21.7*	B	
	Prothonotary Warbler	21	4	1	34.4*	B	
	Acadian Flycatcher	20	4	1	13.7	B	
	White-eyed Vireo	20	5	2	17.8	D	Primarily breeding
	Yellow-throated Vireo	19	4	1	10.8*	B	
	Pine Warbler	19	5	2	22.2*	D	
	Summer Tanager	19	5	2	18.6*	B	
	Orchard Oriole	19	5	2	12.9*	B	
IIIa.	Kentucky Warbler	19	2	1	2.5	B	
IIIb.	Bald Eagle[5]	17	3	2		D	

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
Regional Interest	Great Blue Heron	13	4	1		D	
	Great Egret	14	4	2		D	
	Snowy Egret	14	4	2		D	
	Little Blue Heron	15	4	2		D	
	Tricolored Heron	18	4	3		D	
	Black-crowned Night-Heron	17	4	5		D	
	Yellow-crowned Night-Heron	18	5	2		D	
	Glossy Ibis	17	4	3		D	
	Canada Goose Atlantic pops.	No Score				C	Mostly NC, SC
	Tundra Swan	20	4	1		C	Mostly ne NC
	Wood Duck	17	3	2		D	
	Mallard	15	5	3		D	Mostly winter
	Blue-winged Teal	17	5	3		A	Some winter
	Northern Pintail	16	3	5		C	
	Redhead	21	3	4		C	
	Ring-necked Duck	19	4	2		C	
	Surf Scoter	20	3	4		C	Mostly NC
	White-winged Scoter	17	3	4		C	Mostly NC
	Mississippi Kite	19	3	1		B	Most common FL to SC; Rare and local NC
	Limpkin	16	2	2		R	Iso. pop. Apalachicola, FL
	Semipalmated Plover	17	5	3		A	Many winter
	Spotted Sandpiper	18	5	3		A	Many winter
	Lesser Yellowlegs	18	5	3		A	Many winter
	Common Tern	16	3	4		D	Of special concern VA, NC
	Forster's Tern	19	2	3		D	
	Whip-poor-will	18	3	1		B	
	Red-headed Woodpecker	19	4	2	4.8	D	Primarily breeding

Priority Entry Criteria[1]	Species	Total PIF Priority Species Score	Score: Area Importance	Score: Population Trend	Percent of BBS Population	Local Migratory Status[2]	Geographical or Historical Notes
Regional Interest (cont.).	Eastern Wood-Pewee	18	4	2		B	
	Eastern Kingbird	18	4	4		B	
	Loggerhead Shrike	19	3	4		D	Rare now in NC, VA
	Black-and-white Warbler	14	2	1		D	Primarily breeding, rare winter coastal GA, FL
	Yellow-breasted Chat	16	4	1		B	
	Eastern Meadowlark	16	2	5		D	

[1]Entry criteria:

Ia. Overall Highest Priority Species. Species with total score 28-35. Ordered by total score. Consider deleting species with AI ≤ 2 confirmed to be of peripheral occurrence and not of local conservation interest, but retain species potentially undersampled by BBS or known to have greatly declined during this century.

Ib. Overall High Priority Species. Species with total score 22-27. Ordered by total score. Consider deleting species with AI ≤ 2 confirmed to be of peripheral occurrence and not of local conservation interest, but retain species potentially undersampled by BBS or known to have greatly declined during this century.

IIa. Area Priority Species. Species with slightly lower score total 19-21 with PT+AI=8+. Ordered by total score. These are overall moderate priority species.

IIb. Species with High Percent of BBS Population. Species with score total 19-21 with percent of BBS population above a threshold established (based on relative size of physiographic area), not already listed above, ordered by total score (*signifies highest percentage among physiographic area). These are overall moderate priority species.

IIIa. Additional Species of Global Priority. Add WatchList species (Partners in Flight-National Audubon Society priority species at national level), not already listed in either I or II, with AI=2+. Order by total score. Consider deleting species with AI=2 if confirmed to be of peripheral occurrence and not of local conservation interest, but retain if a local population is viable and/or manageable. These are also overall moderate priority species.

IIIb. Additional Federally Listed Species. Federal listed species if not already included above. Overall low priority, but appropriate legal obligations (Alegal priority species@) to protect through appropriate management and monitoring still apply. Only Bald Eagle meets this criterion in some Southeast physiographic areas.

Other Local or Regional Interest Species. Includes game or nongame species identified by State Working Groups. Also, may include species often meeting criteria for I or II within other physiographic areas and therefore of regional interest for monitoring throughout the Southeast. These are overall low priority species within physiographic area, but may be more important within one or more States (especially where multiple states have designated some special protective status on the species).

[2] Local Migratory Status, codes adapted from Texas Partners in Flight as follows:

A = Breeds in temperate or tropical areas outside of region, and winters in temperate or tropics outside of region (*i.e.*, passage migrant).

B = Breeds in temperate or tropical areas including the region, and winters exclusively in temperate or tropics outside the region (*i.e.*, includes both breeding and transient populations).

C = Breeds in temperate or tropical areas outside of region, and winters in both the region and in temperate or tropical areas beyond area (*i.e.*, includes both transient and wintering populations).

D = Breeds and winters in the region, with perhaps different populations involved, including populations moving through to winter beyond the region in temperate or tropical areas (*i.e.*, populations may be present throughout year, but may include a large number of passage migrants).

E = Species reaching distributional limits within the region, either as short-distance or long-distance breeding migrants, but at population levels above peripheral status.

F = Same as E except for wintering (non-breeding) migrants.

R = Resident, generally non-migratory species (though there may be local movements).

RP= Resident, non-migratory species, reaching distributional limits within the region, but at population levels above peripheral status.

P = Pelagic, breeding grounds outside of region, but can occur during breeding season.

PB = Post-breeding dispersal or non-breeding resident; species present during breeding season, but not known to be breeding in the region proper.

[3]Highest percent of breeding population recorded in temperate North America indicated by A*@; ? indicates species widespread outside of temperate North America and/or waterbirds poorly sampled by Breeding Bird Survey within physio. area.

[4]AI or PT score revised from what was derived by BBS data, or lack thereof, based on better local information.

[5]Species listed as either Federal Endangered or Threatened.

APPENDIX B

SOUTH ATLANTIC COASTAL PLAIN
BIRD ASSEMBLAGES AND HABITAT CONSERVATION PRIORITIES
(from Hunter et al. 2001, Table 4. South Atlantic Coastal Plain Bird-Habitat Associations
TB=threats breeding score, TN=threats non-breeding score)

	Total Score	TB	TN	Notes
EARLY SUCCESSIONAL SHRUB-SCRUB				
<u>Extremely High Priority</u>				
Bewick's Wren (Appalachian)	35		5	Nearing extinction
Painted Bunting (Eastern)	31	4		GA, SC, n. FL, se NC
Bachman's Sparrow	30	4	4	Primarily breeding
Henslow's Sparrow	29		4	FL, GA, SC (?)
<u>High Priority</u>				
Henslow's Sparrow	26	4		NC, VA
American Woodcock	23	3	3	Primarily winter
Prairie Warbler	23	3		
Northern Bobwhite	22	3	3	
Field Sparrow	22	3	3	Primarily winter
<u>Moderate Priority</u>				
Common Ground-Dove	20	4	3	FL to se SC
Eastern Towhee	20	3	2	
Palm Warbler	20		2	
White-eyed Vireo	19	3	2	Primarily breeding
Orchard Oriole	19	3		
<u>Local or Regional Interest</u>				
Whip-poor-will	18	3		Ground nesting
Yellow-breasted Chat	16	3	2	

Table 4 (cont.).

	Total Score	TB	TN	Notes
SOUTHERN PINE (SAVANNAS, FLATWOODS, SANDHILLS)				
<u>Extremely High Priority</u>				
Red-cockaded Woodpecker	32	5	5	Cavity nesting
Bachman's Sparrow	30	4	4	Primarily breeding, ground nesting
Henslow's Sparrow	29		4	Flatwoods, savannas, ground
American Kestrel (Southeast)	28	4	3	Primarily sandhills, cavity nesting
<u>High Priority</u>				
Brown-headed Nuthatch	27	3	3	Cavity nesting
Prairie Warbler	23	3		Understory
Northern Bobwhite	22	3	3	Ground
<u>Moderate Priority</u>				
Red-headed Woodpecker	21	3	3	Primarily breeding, cavity nesting
Chuck-will's-widow	21	3		Ground, open understory
Pine Warbler	19	2	2	
CONIFER-HARDWOOD "GENERALISTS" (INCLUDING SPECIES USING BOTH PINE DOMINATED AND HARDWOOD DOMINATED STANDS)				
<u>Extremely High Priority</u>				
Black-throated Green Warbler	30	4		VA, NC, ne SC; canopy, often non-alluvial wetlands
<u>High Priority</u>				
Wood Thrush	24	3		Midstory nesting, ground foraging
Northern Parula	23	3		Canopy
Hooded Warbler	23	3		Understory
Worm-eating Warbler	23	3		Ground nesting

Table 4 (cont.).

	Total Score	TB	TN	Notes
Yellow-throated Warbler	22	3		Mostly breeding, canopy
Moderate Priority				
Yellow-billed Cuckoo	21	3		Upper midstory
Carolina Chickadee	20	2	1	Cavity nesting
"Watchlist" Species				
Kentucky Warbler	20	3		Ground nesting
Local or Regional Interest				
Acadian Flycatcher	20	3		Midstory
Summer Tanager	19	3		Canopy
Yellow-throated Vireo	19	3		Canopy
Eastern Wood-Pewee	18	3		Midstory
Black-and-white Warbler	14	2	2	Primarily breeding, ground nesting
FORESTED WETLANDS (ALLUVIAL AND NON-ALLUVIAL, EXCEPT POND PINE [TALL] POCOSIN)				
Extremely High Priority				
Swallow-tailed Kite (Southeast)	28	4		Nests in Asuper-emergent@ trees
Swainson's Warbler	28	4		Understory, forages ground
High Priority				
Short-tailed Hawk (Florida)	27	4		St. Marks to Lower Suwannee, FL
Cerulean Warbler	25	4		Roanoke River, NC
American Woodcock	23	3	3	Understory, forages ground
American Black Duck	22	4	3	Breeds VA, NC; formerly wintered to GA
Moderate Priority				
Prothonotary Warbler	21	3		Cavity nesting
Louisiana Waterthrush	21	3		Streamside
Rusty Blackbird	19		3	Roosts in trees, forages ground

Table 4 (cont.).

	Total Score	TB	TN	Notes
Local or Regional Interest				
Wood Duck	19	3	3	Cavity nesting
Mississippi Kite	19	3		Edge nesting
Bald Eagle[1]	17	3	3	
Limpkin (Florida)	17	3	3	Apalachicola, Suwannee

APPENDIX C

NATURAL HERITAGE PROGRAM LIST OF THE RARE BIRDS OF NORTH CAROLINA

Scientific Name Province: Habitat (Counties of occurrence)	Common Name	Status N.C.	 U.S.	Rank N.C.	 Global
BIRDS					
Accipiter striatus MPS: forests and woodlands (for nesting) [breeding evidence only] (Avery, Mitchell+, Orange*, Watauga*, Yancey*)	Sharp-shinned Hawk	SR	-	S2B,S4N	G5
Aegolius acadicus pop 1 M: spruce-fir forests or mixed hardwood/spruce forests (for nesting) [breeding season only] (Avery, Buncombe, Graham, Haywood, Jackson, Macon, Mitchell, Swain, Transylvania, Watauga, Yancey)	Northern Saw-whet Owl - Southern Appalachian population	T	FSC	S2B,S2N	G5T?
Aimophila aestivalis PSC: open longleaf pine forests, old fields [breeding season only] (Bladen, Brunswick, Buncombe*, Carteret, Chatham, Columbus, Craven, Cumberland, Halifax*, Harnett, Hoke, Jones, Macon*, Moore, Onslow, Pender, Richmond, Robeson, Sampson, Scotland, Wake*, Warren)	Bachman's Sparrow	SC	FSC	S3B,S2N	G3
Ammodramus henslowii C: clearcut pocosins and other damp weedy fields [breeding season only] (Beaufort, Bertie, Brunswick, Carteret, Columbus, Edgecombe, Gates, Martin, Onslow, Pender, Pitt, Wilson)	Henslow's Sparrow	SR	FSC	S2B,S1N	G4
Anhinga anhinga C: wooded lakes or ponds, or open swamps (for nesting) [breeding evidence only] (Bertie, Bladen, Brunswick, Carteret*, Columbus*, Craven, Cumberland, Dare, Halifax, Jones, New Hanover, Robeson)	Anhinga	SR	-	S2B,SZN	G5
Botaurus lentiginosus CT: fresh or brackish marshes [breeding season only] (Beaufort*, Carteret, Hyde, Pamlico)	American Bittern	SR	-	S1B,S3N	G4
Catharus guttatus M: spruce-fir forests (for nesting) [breeding season only] (Avery, Haywood, Mitchell, Swain, Yancey)	Hermit Thrush	SR	-	S1B,S5N	G5
Certhia americana M: high elevation forests, favoring spruce-fir mixed with hardwoods	Brown Creeper	SC	-	S3B,S5N	G5

Scientific Name	Common Name	Status		Rank	
Province: Habitat (Counties of occurrence)		**N.C.**	**U.S.**	**N.C.**	**Global**
(Avery, Buncombe, Haywood, Jackson, Mitchell, Swain, Transylvania, Watauga, Yancey)					
Charadrius melodus	Piping Plover	T	T	S2B,S2N	G3
T: ocean beaches and island-end flats [breeding evidence only] (Brunswick, Carteret, Currituck, Dare, Hyde, New Hanover, Onslow, Pender)					
Charadrius wilsonia	Wilson's Plover	SR	-	S3B,SZN	G5
T: beaches, island-end flats, estuarine islands [breeding evidence only] (Brunswick, Carteret, Dare, Hyde, New Hanover, Onslow, Pender)					
Chondestes grammacus	Lark Sparrow	SR	-	S1B,SZN	G5
S: barren, sandy fields with scattered saplings in the sandhills region [breeding season only] (Cumberland, Hoke, Richmond, Scotland)					
Circus cyaneus	Northern Harrier	SR	-	S1B,S4N	G5
T: extensive brackish marshes (for nesting) [breeding evidence only] (Carteret, Dare, Hyde)					
Coccyzus erythropthalmus	Black-billed Cuckoo	SR	-	S2B,SZN	G5
M: deciduous forests, mainly at higher elevations [breeding season and habitat only] (Ashe*, Avery, Buncombe, Burke, Caldwell, Haywood, Henderson, Jackson, McDowell, Mitchell+, Transylvania, Watauga)					
Columbina passerina	Common Ground-Dove	SR	-	SHB,SZN	G5
T: dunes, sandy fields, margins of maritime woods and thickets [breeding season only] (Brunswick, New Hanover, Pender)					
Contopus cooperi	Olive-sided Flycatcher	SC	FSC	SUB,SZN	G4
M: montane conifer forests (mainly spruce-fir) with openings or dead trees [breeding season only] (Haywood, Macon*, McDowell*, Mitchell*, Swain, Yancey)					
Coturnicops noveboracensis	Yellow Rail	SR	-	S2N	G4
TC: brackish or fresh marshes, wet fields [winter season only] (Carteret, Currituck, Dare, Hyde, New Hanover*)					
Dendroica cerulea	Cerulean Warbler	SR	FSC	S2B,SZN	G4
MC: mature hardwood forests; steep slopes and coves in mountains, natural levees in Coastal Plain [breeding season only] (Bertie, Buncombe, Clay, Graham, Halifax, Haywood, Johnston, Macon, McDowell, Northampton, Polk, Rutherford, Transylvania, Watauga, Wilkes)					

Scientific Name	Common Name	Status		Rank	
Province: Habitat (Counties of occurrence)		N.C.	U.S.	N.C.	Global
Dendroica magnolia	Magnolia Warbler	SR	-	S1S2B,SZN,	G5
M: spruce-fir forests, especially in immature stands [breeding season only] (Avery, Buncombe, Graham, Haywood, Jackson*, McDowell, Mitchell, Watauga, Yancey)					
Dendroica virens waynei	Black-throated Green Warbler - Coastal Plain population	SR	-	S3B,SZN	G5TU
C: nonriverine wetland forests, especially where white cedar or cypress are mixed with hardwoods [breeding season only] (Beaufort, Bladen, Brunswick, Camden, Carteret, Craven, Cumberland, Dare, Gates, Hyde*, Jones, Pamlico, Tyrrell, Washington)					
Egretta caerulea	Little Blue Heron	SC	-	S3B,S3N	G5
T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Columbus*, Cumberland, Currituck, Dare, Hyde, Jones, New Hanover, Robeson)					
Egretta thula	Snowy Egret	SC	-	S3B,S3N	G5
T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Columbus*, Currituck, Dare, Hyde, New Hanover, Robeson)					
Egretta tricolor	Tricolored Heron	SC	-	S3B,S3N	G5
T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Currituck, Dare, Hyde, New Hanover)					
Empidonax alnorum	Alder Flycatcher	SR	-	S2B,SZN	G5
M: high elevation shrub/sapling thicket [breeding season only] (Alleghany, Ashe, Avery, Buncombe, Haywood, Jackson, Mitchell, Watauga, Yancey)					
Falco peregrinus	Peregrine Falcon	E	-	S1B,S2N	G4
MT: cliffs (for nesting); coastal ponds and mudflats (for foraging in winter) [nesting evidence; regular wintering sites] (Avery, Brunswick, Buncombe, Burke, Carteret, Dare, Haywood, Hyde*, Jackson, Madison, Rutherford, Stokes, Surry, Transylvania, Wilkes*, Yancey)					
Haematopus palliatus	American Oystercatcher	SR	-	S3B,S4N	G5
T: estuaries, oyster beds, mudflats [breeding evidence only] (records not yet entered)					
Haliaeetus leucocephalus	Bald Eagle	T	T (PD)	S3B,S3N	G4
PCT: mature forests near large bodies of water (for nesting); lakes and sounds [nesting sites; regular non-breeding sites] (Alexander, Anson, Beaufort, Bertie,					

Scientific Name	Common Name	Status		Rank	
Province: Habitat (Counties of occurrence)		**N.C.**	**U.S.**	**N.C.**	**Global**
Bladen, Brunswick, Burke, Camden, Catawba, Chatham, Chowan, Columbus, Craven, Currituck, Dare, Davidson, Durham, Gaston, Granville, Guilford, Halifax, Harnett, Haywood, Hyde, Johnston*, Lenoir, Martin*, Mecklenburg, Montgomery, Nash, Northampton*, Onslow, Orange, Pamlico, Pasquotank, Pitt, Richmond, Rowan, Stanly, Tyrrell, Vance*, Wake, Warren*, Washington, Wilson)					
Himantopus mexicanus	Black-necked Stilt	SR	-	S2B	G5
T: fresh or brackish ponds and impoundments [breeding sites only] (Beaufort, Brunswick,Carteret, Dare, Onslow, Pamlico)					
Ictinia mississippiensis	Mississippi Kite	SR	-	S2B	G5
C: mature, extensive bottomland forests, mainly in Roanoke River floodplain [regular summer locations only] (Bladen, Carteret, Columbus, Halifax, Harnett, Johnston, Martin, Nash, Richmond, Scotland, Wayne)					
Lanius ludovicianus ludovicianus	Loggerhead Shrike	SC	-	S3B,S3N	G4T4
PSC: fields and pastures [breeding season only] (Alamance+, Ashe+, Bladen+, Brunswick, Carteret, Catawba, Chatham, Cleveland, Davie, Edgecombe+, Forsyth, Franklin, Gaston, Granville+, Greene+, Guilford, Halifax, Iredell, Johnston+, Lenoir+, Lincoln, Mecklenburg, Montgomery, Moore, New Hanover+, Pitt, Polk, Richmond, Robeson, Rowan, Rutherford, Scotland+, Stanly, Transylvania+, Wake+, Wayne)					
Lanius ludovicianus migrans	Migrant Loggerhead Shrike	SC	FSC	SUB,SUN	G4T3Q
M: fields and pastures [breeding season only]					
Laterallus jamaicensis	Black Rail	SR	FSC	S3B,S2N	G4
TCP: brackish marshes, rarely fresh marshes [breeding season only] (Carteret, Craven, Currituck, Dare, Hyde, Onslow, Pamlico)					
Loxia curvirostra pop 1	Southern Appalachian Red Crossbill	SC	FSC, S3B,S3N,		G5T?
M: coniferous forests, preferably spruce-fir (Ashe*, Avery, Buncombe, Burke, Haywood, Jackson, McDowell, Mitchell, Swain, Transylvania, Yancey)					
Mycteria americana	Wood Stork	E	E	S1N	G4
T: fresh or brackish ponds (for foraging) [regular non-breeding sites] (Brunswick)					
Passerculus sandwichensis	Savannah Sparrow	SR	-	S2B,S5N	G5
M: grassy fields and pastures					

Scientific Name	Common Name	Status		Rank	
Province: Habitat (Counties of occurrence)		**N.C.**	**U.S.**	**N.C.**	**Global**
[breeding season only] (Alleghany, Ashe, Watauga)					
Passerina ciris ciris	Eastern Painted Bunting	SR	FSC	S3B,SZN	G5T3T4
T: maritime shrub thickets and forest edges [breeding season only] (Brunswick, Carteret, New Hanover, Onslow, Pender)					
Pelecanus occidentalis	Brown Pelican	SR	-	S3B,S4N	G4
T: maritime islands [breeding sites only] (Brunswick, Carteret, Dare, New Hanover)					
Phalacrocorax auritus	Double-crested Cormorant	SR	-	S1B,S5N	G5
CP: lakes with scattered trees for nesting [breeding sites only] (Chatham, Craven)					
Picoides borealis	Red-cockaded Woodpecker	E	E	S2	G3
PSC: mature open pine forests, mainly in longleaf pine [breeding evidence only] (Anson, Beaufort, Bertie, Bladen, Brunswick, Camden*, Carteret, Chatham*, Columbus, Craven, Cumberland, Currituck*, Dare, Duplin, Edgecombe*, Forsyth*, Gates, Halifax*, Harnett, Hertford*, Hoke, Hyde, Johnston, Jones, Lee*, Lenoir*, Montgomery, Moore, Nash*, New Hanover, Northampton*, Onslow, Orange*, Pamlico*, Pender, Pitt*, Richmond, Robeson, Sampson, Scotland, Tyrrell, Wake*, Wayne, Wilson*)					
Plegadis falcinellus	Glossy Ibis	SC	-	S2B,SZN	G5
T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Currituck, Dare, Hyde, New Hanover)					
Poecile atricapillus practicus	Southern Appalachian Black-capped Chickadee	SC	FSC	S3	G5T?
M: high elevation forests, mainly spruce-fir [breeding season only] (Avery, Buncombe*, Haywood, Jackson, Swain, Transylvania, Yancey*)					
Pooecetes gramineus	Vesper Sparrow	SR	-	S2B,S2N	G5
M: high elevation pastures and grassy fields [breeding season only] (Ashe, Avery, Haywood, Mitchell, Watauga)					
Porphyrula martinica	Purple Gallinule	SR	-	SHB	G5
C: freshwater ponds with floating vegetation [breeding sites only] (Brunswick, Onslow*, Robeson)					
Riparia riparia	Bank Swallow	SR	-	SUB,SZN	G5
MP: high, vertical banks for nesting [breeding sites only] (Avery, Wilkes*)					
Rynchops niger	Black Skimmer	SC	-	S3B,S3N	G5
T: sand flats on maritime islands					

Scientific Name / Province: Habitat (Counties of occurrence)	Common Name	Status N.C.	Rank U.S.	Rank N.C.	Rank Global
[breeding sites only] (Brunswick, Carteret, Dare, Hyde, New Hanover, Onslow, Pender)					
Sphyrapicus varius appalachiensis M: mature, open hardwoods with scattered dead trees [breeding season only] (Avery*, Buncombe, Clay*, Graham, Haywood, Henderson, Jackson, Macon, Mitchell*, Swain, Transylvania, Watauga, Yancey)	Appalachian Yellow-bellied Sapsucker	SC	FSC	S3B,S5N	G5T?
Sterna antillarum T: beaches, sand flats, open dunes (Brunswick, Carteret, Craven, Dare, Hyde, New Hanover, Onslow, Pender)	Least Tern	SC	-	S3B,SZN	G4
Sterna caspia T: sand flats on maritime islands [breeding sites only] (Dare, Hyde*)	Caspian Tern	SR	-	S1B,S2N	G5
Sterna dougallii T: sand flats on maritime islands [breeding evidence only] (Carteret*, Dare)	Roseate Tern	E	E	SAB,SZN	G4
Sterna hirundo T: sand flats on maritime islands [breeding sites only] (Carteret, Dare, Hyde, New Hanover, Onslow, Pender)	Common Tern	SC	-	S3B,SZN	G5
Sterna nilotica T: sand flats on maritime islands [breeding sites only] (Brunswick, Carteret, Dare, Hyde, Onslow*)	Gull-billed Tern	T	-	S3B,SZN	G5
Thryomanes bewickii altus M: woodland borders or openings, farmlands or brushy fields, at high elevations [breeding season only] (Ashe*, Avery*, Buncombe*, Haywood*, Jackson*, Macon*, Transylvania*)	Appalachian Bewick's Wren	E	FSC	SHB,SZN	G5T2Q
Vermivora chrysoptera M: old fields and successional hardwoods (Alleghany, Ashe, Watauga; plus many additional counties)	Golden-winged Warbler	SR	-	S3B,SZN	G4
Vermivora pinus M: low elevation brushy fields and thickets [breeding season only] (Alleghany, Ashe, Buncombe*, Cherokee*, Graham*, Macon)	Blue-winged Warbler	SR	-	S2B,SZN	G5
Vireo gilvus M: groves of hardwoods along rivers and streams [breeding season only] (Alleghany, Ashe, Avery, Buncombe, Cleveland, Halifax, Henderson, Macon*, Orange, Watauga)	Warbling Vireo	SR	-	S2B,SZN	G5

NATURAL HERITAGE PROGRAM LIST OF THE WATCH LIST BIRDS OF NORTH CAROLINA

Only the breeding season populations are of concern; provinces and habitats are for these populations only.

Scientific Name / Province: Habitat (Counties of occurrence)	Common Name	Status N.C.	Status U.S.	Rank N.C.	Rank Global
Accipiter cooperii MPSC: forests and woodlands	Cooper's Hawk	SC	-	3S4B,S4N	G5
Accipiter gentilis M: extensive, remote forests, mainly at high elevations	Northern Goshawk	W3	-	SUB,SZN	G5
Ammodramus caudacutus T: tidal marshes	Saltmarsh Sharp-tailed Sparrow	W3	-	SUB,S4N	G4
Ammodramus savannarum PSCM: pastures and other grasslands	Grasshopper Sparrow	W1,W5	-	S3B,S1N	G5
Anas discors TC: fresh to slightly brackish marshes, usually at impoundments	Blue-winged Teal	W2	-	SHB,S2N	G5
Anas rubripes TC: fresh or brackish marshes, often at impoundments	American Black Duck	W1	-	S3B,S4N	G5
Asio flammeus TC: coastal marshes	Short-eared Owl	W3	-	SUB,S3N	G5
Asio otus M: high elevation forests in northern mountains	Long-eared Owl	W3	-	SUB,SZN	G5
Carduelis pinus M: spruce-fir forests	Pine Siskin	W3	-	SUB,S4N	G5
Coragyps atratus MPSC: forested areas for nesting; forests or open country for foraging	Black Vulture	SC	-	S3S4	G5
Corvus corax MP: cliffs for nesting; forests or fields (mainly at high elevations) for foraging	Common Raven	W2	-	S3	G5
Dendroica coronata M: spruce-fir forests, especially in immature stands	Yellow-rumped Warbler	W3	-	SUB,S5N	G5
Dolichonyx oryzivorus M: meadows and other grasslands	Bobolink	W3,W5	-	SUB,SZN	G5
Elanoides forficatus C: extensive swamps and bottomlands, often forages over nearby fields or marshes	Swallow-tailed Kite	W3	-	SUB,SZN	G5
Empidonax minimus M: open hardwood forests, groves, streamside trees	Least Flycatcher	W2	-	S3B,SZN	G5
Empidonax traillii MP: wet thickets in open country, often along streams in broad valleys	Willow Flycatcher	W2	-	S3B,SZN	G5
Eudocimus albus T: forests or thickets on maritime islands	White Ibis	W2	-	S3B,S3N	G5

Scientific Name Province: Habitat (Counties of occurrence)	Common Name	Status N.C.	 U.S.	Rank N.C.	 Global
Falco sparverius MPSC: open country; nests in cavities, even in buildings or poles in cities	American Kestrel	W1,W5	-	S3B,S5N	G5
Helmitheros vermivorus pop 1 C: nonriverine wet hardwoods, pocosins	Worm-eating Warbler - Coastal Plain population	W5	-	S3B,SZN	G5T?
Icterus galbula MP: hardwood groves or streamside trees, in open country	Baltimore Oriole	W2	-	S3B,S3N	G5
Ixobrychus exilis TCSP: fresh or brackish marshes	Least Bittern	W3	-	S3B,SZN	G5
Limnothlypis swainsonii CSMP: forests with dense understory, often with cane in Coastal Plain and rhododendron in mountains	Swainson's Warbler	W2,W5	-	S3B,SZN	G4
Lophodytes cucullatus PMC: lakes and ponds, with dead trees for nesting	Hooded Merganser	W3	-	S1B,S4N	G5
Nyctanassa violacea TCP: swamps; woods or thickets on maritime islands	Yellow-crowned Night-Heron	W2,W3	-	S3B,SZN	G5
Pheucticus ludovicianus M: hardwood forests at mid- to high elevations	Rose-breasted Grosbeak	W1	-	S3B,SZN	G5
Rallus elegans TCPS: fresh to slightly brackish marshes	King Rail	W1,W3	-	S3B,S3N	G4G5
Regulus satrapa M: spruce-fir forests; hardwood forests mixed with spruce or hemlock	Golden-crowned Kinglet	W2	-	S3S4B,S5N,	G5
Sitta canadensis M: high-elevation coniferous forests, preferably spruce-fir	Red-breasted Nuthatch	W2,W5	-	S3B,S4N	G5
Spiza americana PC: fallow fields and pastures with tall forbs	Dickcissel	W3,W5	-	S2B,SZN	G5
Sterna forsteri T: salt or brackish marshes, nesting on wrack material or matted grasses	Forster's Tern	W2	-	S3B,S5N	G5
Sterna fuscata T: sand flats on maritime islands; forages over open ocean	Sooty Tern	W2	-	SUB,S3N	G5
Sterna sandvicensis T: sand flats on maritime islands	Sandwich Tern	W2,W5	-	S3B,SZN	G5
Tachycineta bicolor MPC: cavities near ponds or other open water	Tree Swallow	W2	-	S2S3B,S4N,G5	
Troglodytes troglodytes M: cool, moist forests at mid- to high elevations	Winter Wren	W2,W5	-	S3B,S5N	G5

Scientific Name	Common Name	Status		Rank	
Province: Habitat (Counties of occurrence)		N.C.	U.S.	N.C.	Global
Tyto alba	Barn Owl	W2,W3	-	S3B,S3N	G5
MPSCT: extensive open country, nesting in old buildings, silos, large tree cavities					

LIST FORMAT

Species are grouped by major taxa. The vertebrates are arranged by class, beginning with the most advanced phylogenetically (mammals). Within a given taxa, species are listed alphabetically by scientific name. The following information is presented for each species on the list. "Status" is a word or phrase that indicates the degree of protection (if any), based on rarity, of a species; "rank" is a numerical scale of the rarity of a species, regardless of legal protection.

Scientific Name.

Common Name. For most groups, these names are not standardized.

North Carolina Status. Endangered, Threatened, and Special Concern species of mammals, birds, reptiles, amphibians, freshwater fishes, freshwater and terrestrial mollusks, and crustaceans have legal protection status in North Carolina (Wildlife Resources Commission). In addition to the above categories, the Natural Heritage Program maintains computer and map files on Significantly Rare species, as well as species considered Extirpated. Paper files only are maintained for a few of the above species; these species are indicated by the phrase "not tracking."

STATUS CODE	STATUS	DEFINITION
E	Endangered	"Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
T	Threatened	"Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
SC	Special Concern	"Any species of wild animal native or once-native to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this Article." (Article 25 of Chapter 113 of the General

STATUS CODE	STATUS	DEFINITION
		Statutes; 1987).
P_	Proposed	Species has been proposed by a Scientific Council as a status (Endangered, Threatened, Special Concern, Watch List, or for De-listing) that is different from the current status, but the status has not yet been adopted by the General Assembly as law. In the lists of rare species in this book, these proposed statuses are listed in parentheses below the current status. Only those proposed statuses that are different from the current statuses are listed.
SR	Significantly Rare	Any species which has not been listed by the N.C. Wildlife Resources Commission as an Endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring. (This is a N.C. Natural Heritage Program designation.) Significantly Rare species include "peripheral" species, whereby North Carolina lies at the periphery of the species' range (such as Hermit Thrush).
EX	Extirpated	A species which is no longer believed to occur in the state. (This is a N.C. Natural Heritage Program designation, though WRC also uses this status; the NHP list includes those on the WRC list.)
W	Watch List	Any other species believed to be of conservation concern in the state because of scarcity, declining populations, threats to populations, or inadequacy of information to assess its rarity (see page 59 for a more complete discussion). (This is a N.C. Natural Heritage Program designation.)
G	----	Species is a game animal, and therefore (by law) cannot be listed for State protection as E, T, or SC.

United States Status. This status is designated by the U.S. Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended through the 100th Congress. Unless otherwise noted, definitions are taken from the *Federal Register*, Vol. 56, No. 225, November 21, 1991 (50 CFR Part 17).

STATUS CODE	STATUS	DEFINITION
E	Endangered	A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T	Threatened	A taxon "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
FSC	(Federal) Species of Concern	"... the Service is discontinuing the designation of Category 2 species as candidates in this notice. The Service remains concerned about these

STATUS CODE	STATUS	DEFINITION
	[also known as Species at Risk]	species, but further biological research and field study are needed to resolve the conservation status of these taxa. Many species of concern will be found not to warrant listing, either because they are not threatened or endangered or because they do not qualify as species under the definition in the [Endangered Species] Act. Others may be found to be in greater danger of extinction than some present candidate taxa. The Service is working with the States and other private and public interests to assess their need for protection under the Act. Such species are the pool from which future candidates for listing will be drawn." (*Federal Register*, February 28, 1996). The Service suggests that such taxa be considered as "Species of Concern" or "Species at Risk", neither of which has official status. The N.C. Natural Heritage Program uses "(Federal) Species of Concern" in this document for those taxa formerly considered as Category 2.
P_	Proposed	Species proposed in the *Federal Register* as a status different from its current Federal status.
T (S/A)	Threatened due to Similarity of Appearance	"Section 4 (e) of the [Endangered Species] Act authorizes the treatment of a species (subspecies or population segment) as endangered or threatened even though it is not otherwise listed as endangered or threatened if -- (a) the species so closely resembles in appearance an endangered or threatened species that enforcement personnel would have substantial difficulty in differentiating between the listed and unlisted species; (b) the effect of this substantial difficulty is an additional threat to an endangered or threatened species; and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Act." (*Federal Register*, November 4, 1997). [The American Alligator is listed as T (S/A) due to Similarity of Appearance with other rare crocodilians, and the southern population of the Bog Turtle is listed as T (S/A) due to Similarity of Appearance with the northern population of the Bog Turtle (which is federally listed as Threatened and which does not occur in North Carolina).]
XN	Nonessential Experimental Population	"Section 10 (j) of the Endangered Species Act of 1973, as amended, provides for the designation of introduced populations of federally listed species as nonessential experimental. This designation allows for greater flexibility in the management of these populations by local, state, and Federal agencies. Specifically, the requirement for Federal agencies to avoid jeopardizing these populations by their actions is eliminated and allowances for taking the species are broadened." (U.S. Fish and Wildlife Service, 1995).
D	De-listed	Species has been proposed by the U.S. Fish and Wildlife Service for

STATUS CODE	STATUS	DEFINITION
		de-listing from the List of Endangered and Threatened Wildlife. However, at the present time, the species is still on the List of Endangered and Threatened Wildlife and is thus protected under the Endangered Species Act. Because such species still have legal Federal protection, the NHP will maintain existing records on the species, though new records might not necessarily be added. If the status becomes law prior to the next publication of the NHP Rare Animal List, the Program will remove the Federal designation from its database (and thus the species will no longer appear on printouts of Federally listed species). NHP may or may not continue to track the species, depending on its legal State status and other factors such as overall abundance and range in the state.

North Carolina Rank. North Carolina ranks are based on The Nature Conservancy's system of measuring rarity and threat status. This system is widely used by other agencies and organizations, as the best available scientific and objective assessment of a species' rarity at the state level. State ranks are assigned by biologists within each Natural Heritage Program.

RANK	NUMBER OF EXTANT POPULATIONS	DESCRIPTION
S1	1-5	Critically imperiled in North Carolina because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from North Carolina.
S2	6-20	Imperiled in North Carolina because of rarity or because of some factor(s) making it very vulnerable to extirpation from North Carolina.
S3	21-100	Rare or uncommon in North Carolina.
S4	100-1000	Apparently secure in North Carolina, with many occurrences.
S5	1000+	Demonstrably secure in North Carolina and essentially ineradicable under present conditions.
SA	1-?	Accidental or casual; one to several records for North Carolina, but the state is outside the normal range of the species.
SH	0?	Of historical occurrence in North Carolina, perhaps not having been verified in the past 20 years, and suspected to be still extant.
SR	--	Reported from North Carolina, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.
SX	0	Apparently extirpated from North Carolina.
SU	--	Possibly in peril in North Carolina but status uncertain; need more information.

S?	--	Unranked, or rank uncertain.
_B	1-?	Rank of the breeding population in the state. Used for migratory species only.
_N	1-?	Rank of the non-breeding population in the state. Used for migratory species only.
_Z_	1-?	Population is not of significant conservation concern. For example, the status "SZN" indicates that the population in the non-breeding seasons (generally in migration or in winter) is transitory, without any regular locales of occurrence whereby the species can be protected. Where a number is listed with the "B" or "N" modifier, there are definable locales of occurrence that can be identified for protection.

Global Rank. Global ranks are assigned by NatureServe (formerly the science branch of The Nature Conservancy) staff biologists and contract biologists, based on a consensus of scientific experts, the individual natural heritage programs, and the Natural Heritage Network. Global ranks apply to the status of a species throughout its range, and are based on data on the species' status rangewide. This system is widely used by other agencies and organizations, as the best available scientific and objective assessment of a species' rarity throughout its range. NOTE: Global ranks in brackets are those suggested by Scientific Councils in North Carolina, or by the N.C. Natural Heritage Program, and are not NatureServe's assigned ranks. These suggested ranks are listed below the TNC assigned ranks. In some cases, these suggested ranks were made to indicate that the Global Rank perhaps should be changed, with the taxa apparently more common in North Carolina than the Global Rank will allow (i.e., a rank of S3 G2 isn't technically allowed; thus, the global rank is suggested to be G3.)

RANK	NUMBER OF EXTANT POPULATIONS	DESCRIPTION
G1	1-5	Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction.
G2	6-20	Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction throughout its range.
G3	21-100	Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single physiographic region) or because of other factors making it vulnerable to extinction throughout its range.
G4	100-1000	Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5	1000+	Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
GH	0?	Of historical occurrence throughout its range, i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

RANK	NUMBER OF EXTANT POPULATIONS	DESCRIPTION
GX	0	Believed to be extinct throughout its range (e.g., Passenger Pigeon) with virtually no likelihood that it will be rediscovered.
GU	--	Possibly in peril range-wide, but status uncertain; more information is needed.
G?	--	Unranked, or rank uncertain.
G_Q	--	Questionable taxonomic assignment.
T_	--	The rank of a subspecies or variety. As an example, G4T1 would apply to a subspecies of a species with an overall rank of G4, but the subspecies warranting a rank of G1.

Physiographic Province/Region. The provinces/regions in which the animal is known to occur are indicated. This should not be regarded as the only province(s) or region(s) of the state in which the species could occur; our knowledge of the fauna of North Carolina, especially the invertebrates, is still very imperfect. The provinces are abbreviated as follows:

M	Mountains	All parts of North Carolina west of the foot of the Blue Ridge Escarpment.
P	Piedmont	All parts of North Carolina east of the foot of the Blue Ridge Escarpment and west of the Fall Line, including outlying "foothill" ranges, such as the Brushy, Uwharrie, and Sauratown mountains.
S	Sandhills	The southwestern portion of the Coastal Plain province consisting mostly of deep aeolian sands of the Middendorf and Pinehurst formation (portions of Cumberland, Harnett, Hoke, Lee, Moore, Richmond, Scotland, and Montgomery counties). The Sandhills are actually part of the Coastal Plain but are here distinguished because of their distinctive geomorphology and vegetation.
C	Coastal Plain	All parts of North Carolina east of the Fall Line, but excluding the Sandhills region and those portions associated with tidal water (ocean, sounds, barrier islands, and mainland brackish or salt marshes).
T	Tidewater	That part of the state associated with tidal water, such as the ocean and barrier islands, sounds, estuaries, and mainland brackish or salt marshes.

Habitat. The known, or the most typical, habitats are described briefly; as with provinces, these should not be regarded as the only possible habitats of the species in the state.

Counties of occurrence. Following the description of habitats is a listing, in parentheses, of the known counties of occurrence of the records in the Natural Heritage Program database. For most vertebrate species, this listing of counties is complete or reasonably complete. However, for many invertebrates,

and a few vertebrates (generally those newly added to the Rare List), there is no listing of counties, as records have yet to be added to the database. Where county names appear in brackets, records from these counties have not yet been added to the database.) **Counties in which the element was last observed more than 20 years ago are marked with an asterisk (*).** The asterisk does not necessarily mean that the species no longer exists in that county; simply, it means that the date of the last observation available to the Natural Heritage Program from that county is 1983 or earlier. **Counties where no date of occurrence (e.g., data from an atlas/dot map) is available are marked with a plus (+).** Without additional information, the Program has no way of knowing whether such data should be considered as current or historic (marked with *). Records from such references, atlases, and other lists that were published or made available to the Program from 1983 or earlier should be considered as historic, but the Program has not yet updated the database for these obscure date records.

WATCH LIST CODES

W1 = species known to be declining in the state; may need listing in upcoming years
W2 = species rare to uncommon, but probably not in trouble
W3 = species that is poorly known; perhaps needs listing in upcoming years
W4 = species reported from the state without adequate documentation
W5 = species with increasing amount of threats to its habitat, whether populations are known to be declining or not
T = Threatened (see Page 3). Though still on the State Protected List, biologists consider the species to no longer need tracking by the N.C. Natural Heritage Program.
SC = Special Concern (see Page 3). Though still on the State Prote

APPENDIX D

US Fish and Wildlife Service Species of Conservation Concern (2002) in the Southeastern Coastal Plain (BCR 27)

Black-capped Petrel
Audubon's Shearwater
Little Blue Heron
Reddish Egret
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 (except where Endangered)
Black Tern
Black Skimmer
Common Ground-Dove
Burrowing Owl
Chuck-will's-widow
Brown-headed Nuthatch
Bewick's Wren
Wood Thrush
Northern Parula
Black-throated Green Warbler
Prairie Warbler
Cerulean Warbler
Swainson's Warbler
Bachman's Sparrow
Henslow's Sparrow
Le Conte's Sparrow
Nelson's Sharp-tailed Sparrow
Saltmarsh Sharp-tailed Sparrow
Seaside Sparrow
Painted Bunting
Orchard Oriole