FINAL DRAFT

Avian Conservation Implementation Plan
Guilford Courthouse National Military Park

National Park Service
Southeast Region

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

GUCO Resource Management Staff, National Park Service
And Bird Conservation Partners
January 2005

TABLE OF CONTENTS

Introduction

This Avian Conservation Implementation Plan (ACIP) is provided to the staff at Guilford Courthouse National Military Park (GUCO) 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 GUCO is primarily upland forest, recommendations will be provided in the ACIP for landbird and habitat conservation and will be derived from the appropriate PIF bird conservation plans, PIF being largely a landbird conservation initiative. However, all high priority bird conservation issues for GUCO will be discussed and integrated as appropriate.

Information and data presented in the ACIP have been obtained from several sources: 1) interviews with GUCO staff 2) GUCO bird conservation partners 3) the PIF Southern Piedmont Bird Conservation Plan, (Cooper 2000), 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 GUCO resource management staff and managers, Southeast Coast Inventory and Monitoring Network (SEC I&M) staff, and bird conservation partners and approved by GUCO management. Optimally, this plan will be incorporated into the park's Resource Management Plan and updated annually to reflect completed projects, newly identified needs, and shifts in bird conservation priorities in the region.

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

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

Role of NPS in Avian Conservation

The interagency agreement that facilitates this partnership supports both FWS and NPS management policies. Specifically for the NPS, the agreement supports and advances the Strategy for Collaboration, a visionary document developed and signed by the Southeast Natural Resource Leaders Advisory Group (SENRLAG 2000), a consortium of 13 land and resource management agencies in the Southeastern United States whose vision is to encourage and support cooperation in planning and managing the region's natural resources. Furthermore, the agreement is aligned with and implements a variety of NPS Management 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 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 Kennesaw Mountain National Battlefield Park, Obed Wild and Scenic River, and Timicuan Ecological and Historic Preserve.

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

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

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

are considered of global importance (http://abcbirds.org/iba/aboutiba.htm). In the Southeast Region, the NPS has 13 global IBA's.

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

Park Flight is a NPS international partnership initiative that directs funding toward a variety of NPS programs that involve conservation of Neotropical migratory birds whose life history range covers a 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

In 1781, Nathanael Greene, commanding General of the Continental Army's Southern Department, was defeated at Guilford Courthouse by the British General Lord Cornwallis. Although Greene's army suffered defeat, his losses were slight, whereas Cornwallis suffered overwhelming losses, a situation that greatly hastened the end of the Revolutionary War. This 89 ha site (located near Greensboro, North Carolina) preserves the battlefields and commemorates the battle with 28 monuments (USDI NPS 2000).

At the time of the battle, this area was predominantly under cultivation. Today, GUCO contains mowed fields and flat upland woods of mixed pine and hardwoods, particularly oak species. A small stream made up of two tributaries flows north out of the Park (USDI NPS 2000).

Avian Resources of the Southern Piedmont (Cooper 2000)

The Southern Piedmont as defined in this plan consists of approximately 13 million ha in Alabama, Georgia, South Carolina, and North Carolina (see PIF map and NPS location maps below). The physiographic area is characterized by irregular plains and open hills with occasional tablelands. Elevations range primarily from 100-300 feet, but rise to 1,300 feet at the interface with the southern edge of the Southern Blue Ridge. Major rivers flowing through the Piedmont are the Tallapoosa in Alabama/Georgia, the Alcovy, Appalachee, Broad, Chattahoochee, Flint, Little, Ocumulgee-Oconee, Ogeechee, and Yellow in Georgia, the Savannah on the Georgia/South Carolina border, the Broad, Catawba, Enoree, Long Crane, Lynchees, Pacolet, Reedy, Saluda, Stevens, and Tyger in South Carolina, and the Dan, Deep, Haw, Rocky, and Yadkin in North Carolina.

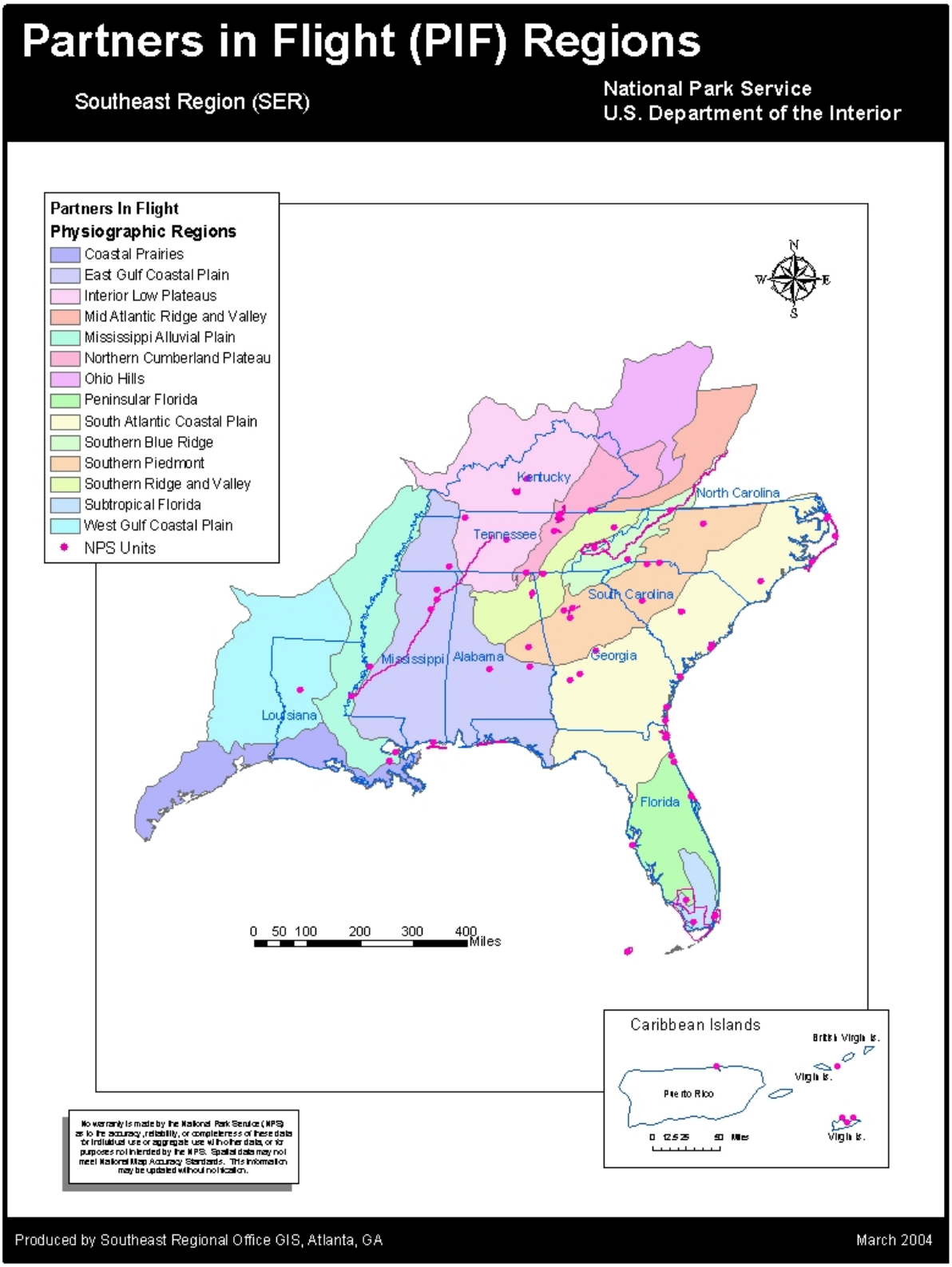
The primary potential natural forest vegetation in the Southern Piedmont is oak-hickory-pine and Southern mixed forests. The distribution of the oak-hickory-pine forest type includes the Southern Cumberland Plateau and Ridge and Valley physiographic area of Georgia and Alabama, the Piedmont, a majority of the Coastal Plain, and Ouachita Highlands. Dominant hardwoods are white, northern red, black, southern red, blackjack and post oaks, and shagbark, pignut, and mockernut hickories. Tulip (yellow) poplar was probably an important and stable codominant (again, at least in the Piedmont) prior to European colonization. Dogwood, sourwood, sweetgum, tulip (yellow) poplar, and red maple dominate the understory layer.

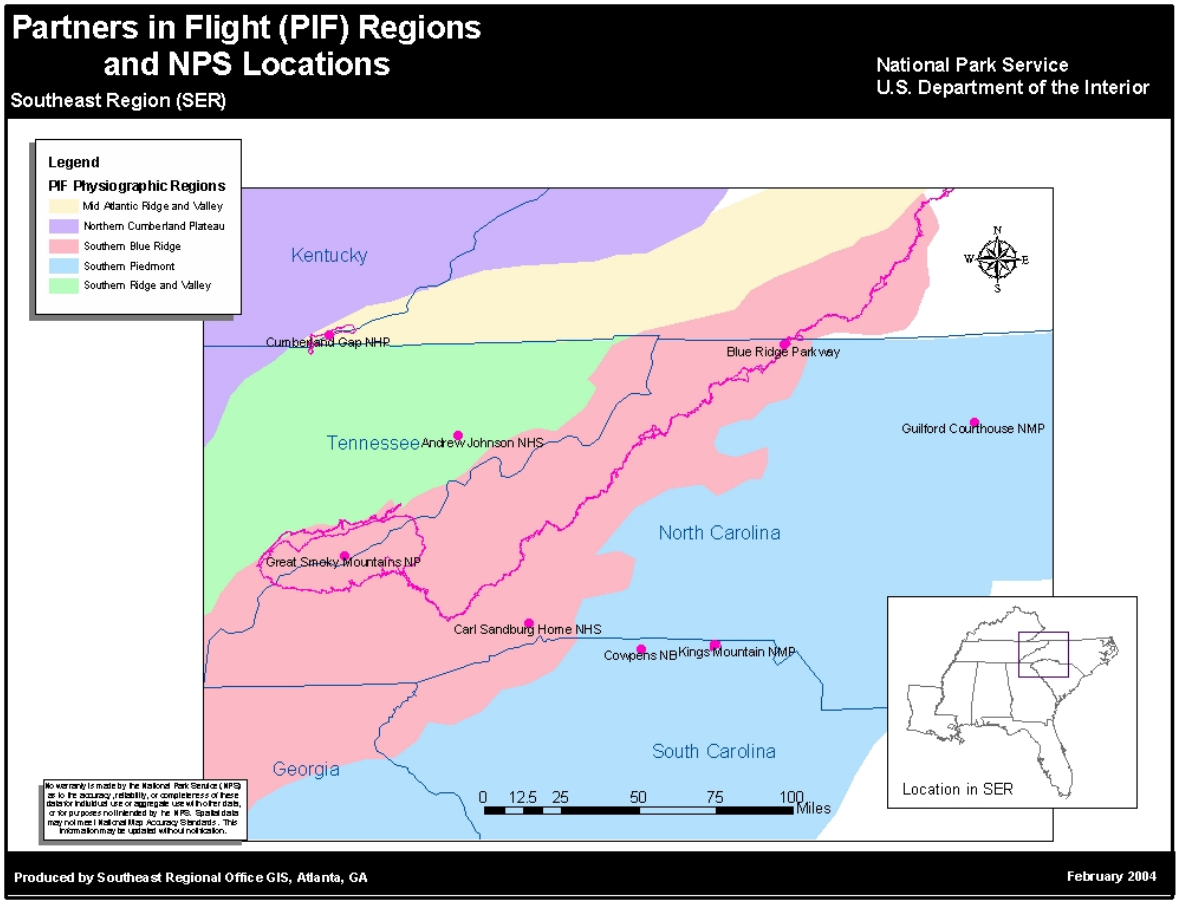
Shortleaf and loblolly are the dominant pine species found in combination with many of the above hardwoods in Southern mixed forests. There are also scattered stands of longleaf pine, especially along the Fall Line with the Coastal Plain. However, Native Americans frequently used fire, and in the Piedmont their low-intensity burning probably increased the general dominance of oaks while encouraging a greater presence of pines than under purely natural conditions. By 1850, much of the original forest cover was cleared from the Piedmont and replaced with cropland. Oaks and other hardwoods mostly grew on the best soils, which were selectively converted to agriculture.

Most of the remaining larger forest blocks are commercial pine or public lands. Overall, forest makes up almost 70% of the Southern Piedmont, but much of this is in or soon will be in development.

The three primary goals of the PIF Southern Piedmont plan are to:

1) maintain viable (stable or increasing) populations of all native species,
2) maintain or enhance ecosystem health, minimizing negative effects of land use, and
3) accomplish conservation goals while maintaining production of goods and services (e.g., timber products, consumptive and non-consumptive wildlife uses) from natural and agricultural ecosystems.


Partners in Flight (PIF) Regions
Southeast Region (SER)
National Park Service
U.S. Department of the Interior
Partners In Flight
Physiographic Regions
Coastal Prairies
East Gulf Coastal Plain
Interior Low Plateaus
Mid Atlantic Ridge and Valley
Mississippi Alluvial Plain
Northern Cumberland Plateau
Ohio Hills
Peninsular Florida
South Atlantic Coastal Plain
Southern Blue Ridge
Southern Piedmont
Southern Ridge and Valley
Subtropical Florida
West Gulf Coastal Plain
NPS Units
N
W
E
S
Kentucky
North Carolina
Tennessee
South Carolina
Mississippi
Alabama
Georgia
Louisiana
Florida
0 50 100 200 300 400
Miles
Caribbean Islands
British Virgin Is.
Virgin Is.
Puerto Rico
0 12.5 25 50 Miles
Virgin Is.
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.
Produced by Southeast Regional Office GIS, Atlanta, GA
March 2004



The management plan for the Southern Piedmont will focus on a relative few priority species of birds, which will be used as "umbrella" species for the other birds. It is a major assumption of this plan that by providing adequate habitat for maintaining viable populations of these umbrella species, adequate habitat will be provided for all other birds as well. Each of the species below, with the possible exception of the Swainson's Warbler, fits this description.

Forest interior species (Upland deciduous/ mixed). The Piedmont forest birds chosen to serve as umbrella are the Wood Thrush and Summer Tanager. These species were chosen because they are believed to be area sensitive and because they have been sufficiently well studied to provide the knowledge base needed to make informed management decisions. Many intensive demographic studies have been conducted in the eastern U.S. on the Wood Thrush. While there have been fewer studies on the Summer Tanager, Project Tanager has provided data on area sensitivity.

Early successional species. In farmland or grassland dominated habitats, the Northern Bobwhite is a species of both high regional importance and conservation concern. This was chosen as an umbrella species because: (1) it is a declining species believed to be

representative of an early successional habitat species suite associated with agricultural landscapes; (2) it is economically important as a game species, and hunters and private land owners are important stakeholder groups in this process; (3) there are already serious management efforts to increase habitat for this species (e.g., many Farm Bill efforts); and (4) the habitat requirements for this species are well-studied and specific recommendations can be made without further study. The Prairie Warbler was chosen as a second umbrella species because, while it occupies a variety of early successional habitats such as abandoned fields and woodland margins, it is associated more with forested landscapes with large openings such as those provided by regeneration cuts than with agricultural areas.

Riparian species. The Swainson's Warbler, Louisiana Waterthrush and Acadian Flycatcher are considered both the most sensitive and representative species in this habitat type. Of the three, Swainson's Warbler is probably the most area sensitive, Louisiana Waterthrush is the most closely tied to riparian areas, especially streams, and the Acadian Flycatcher has been the subject of the most studies.

Avian Conservation in GUCO

Avian Biodiversity: GUCO has a partial avian inventory and no bird checklist. Verified records of birds in GUCO 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.

Park Priorities: Park staff has identified resident Canada Goose as a species in need of management due to their numbers damaging park landscape. Park staff are also concerned about conserving all birds and their habitats in GUCO.

Inventory: Bird inventory data provide important information for park management, particularly when inventories are conducted within the framework of the NPS I&M Program. Inventories are being planned under the Southeast Coast I&M Network study plan (USDI NPS 2000).

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

It is unknown if any North Carolina Rare Bird Species are known to regularly occur in GUCO. However, potentially several North Carolina Watch List bird species may occur in the park (Appendix C (to be added on next revision).

Several high priority PIF species for the Southern Piedmont occur in GUCO but their breeding status is unknown (Appendixes A-B) and include Red-headed Woodpecker, Whip-poor-will, and Field Sparrow. It is likely that further inventory will yield presence of additional high priority species in GUCO.

Monitoring: Currently, no avian monitoring projects are being conducted at GUCO.

Research: Scientific research is permitted within the park, but no active avian research is ongoing.

Outreach: No educational and outreach programs related to birds are undertaken in the park.

Park Identified Needs for Avian Conservation

GUCO has identified completion of the avian inventory as important to park management.

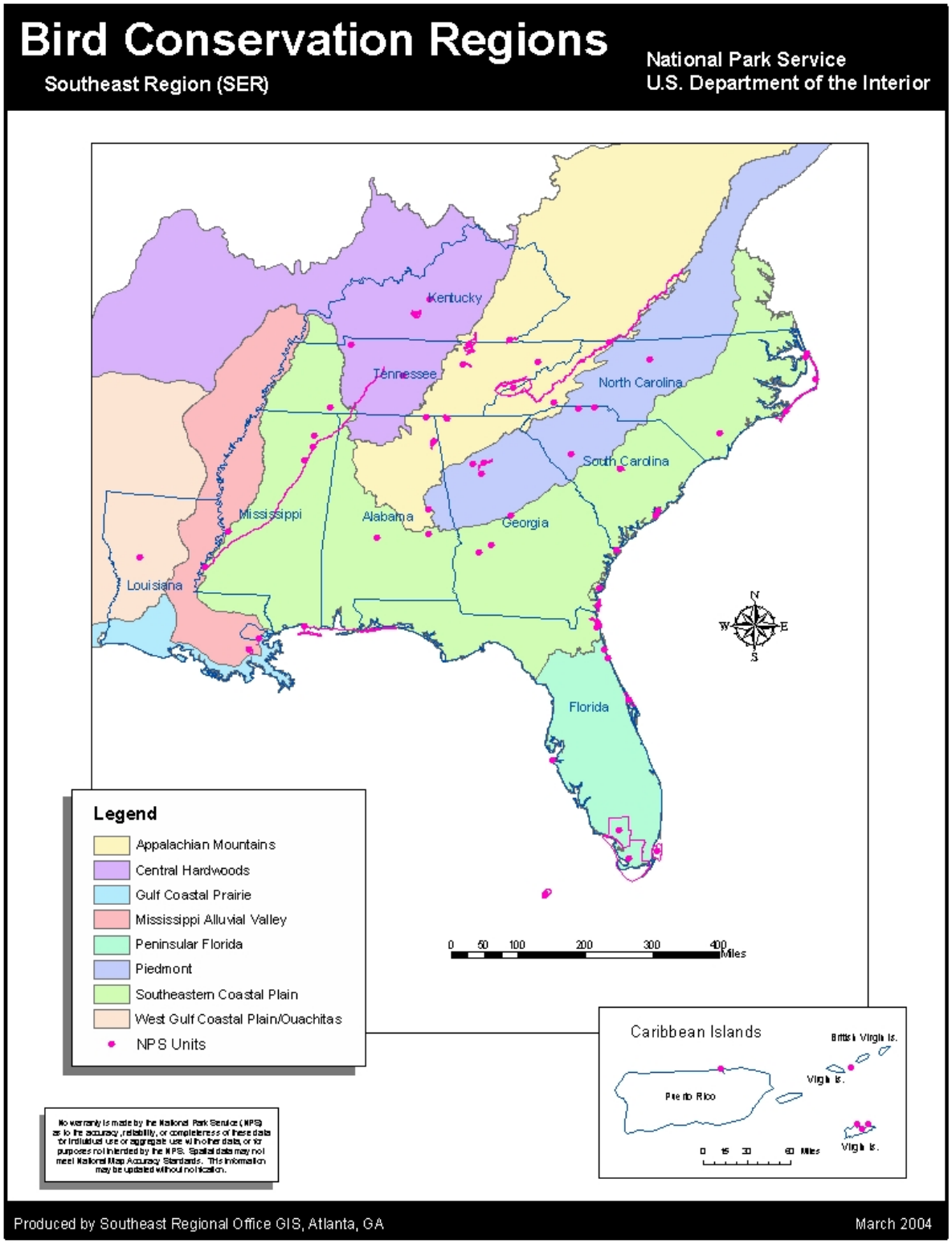
Coordination with Regional Conservation Initiatives

North American Bird Conservation Initiative: NABCI bird conservation planning units, referred to as Bird Conservation Regions (BCR), are often larger than other planning units associated with other plans, such as Partners In Flight. For example, GUCO is within the NABCI Piedmont BCR that extends from New Jersey to east-central Alabama and lies between the Appalachian Mountains and Southeastern Coastal Plain BCR's (see 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 Piedmont BCR does not have a designated coordinator; however, a bird conservation coordinator for the Southeastern Coastal Plain and Appalachian Mountains BCR's can provide valuable assistance to GUCO 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).

Partners In Flight: Goals and strategies for the Southern Piedmont can be found in the draft bird conservation plan, not yet available to the public. The current plan identifies priority bird and habitat conservation goals that must be implemented in order to achieve bird conservation success in this region. GUCO being largely a landbird park will utilize this plan more than any other plan to participate in NABCI implementation.


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
Produced by Southeast Regional Office GIS, Atlanta, GA
March 2004

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 GUCO to implement recommendations identified in this ACIP and projects important to bird conservation relative to North Carolina's role in implementation of the Southern Piedmont PIF plan.

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. Since GUCO has little habitat of regional importance to shorebird conservation, recommendations for shorebird conservation are not presented.

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/). Few waterbird conservation priorities exist on the Southern Piedmont and none are presented here for GUCO.

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, implementation of EO 13186 (US Government 2000) will require NPS to incorporate a wide range of bird conservation programs into planning and operations. The development of the MOU between the FWS and the NPS will establish a formal agreement to promote bird conservation within the agency by incorporating goals and strategies of existing bird conservation initiatives, plans, and goals into park planning and operations.

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

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

Inventory: An inventory of birds in the park is needed. Information regarding the status of high priority species (as identified in the Southern Piedmont bird conservation plan and the USFWS Species of Conservation Concern [2002]) is needed to effectively structure park management for the continued preservation and enhancement of the park's avifauna.

Inventory is needed in all habitats during all seasons for all potenial landbird groups, especially forest, grassland, and edge habitats, migrants, and nocturnal species.

Additionally, GUCO is encouraged to:

- **determine distribution and abundance of high priority species as identified in the Southern Piedmont 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 and monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000; Hunter 2000)**

Monitoring: The park does not have an avian monitoring program in place. The park is encouraged to consider establishing permanent monitoring stations in main habitat types to collect baseline data on the distribution and relative abundances of 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. Close coordination with the state PIF coordinator is needed to 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:

- **consider establishment of a monitoring program to track changes in high priority forest species (following identification of these species in inventory)***

- **work with local bird clubs to establish a Christmas Bird Count circle that encompasses all of the park***

- **enter data into the appropriate database (NPSpecies, National Point Count Database, eBird)***

- **standardize inventory and 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.

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 GUCO lands, and generally those in the national park system, the condition of habitats for bird use may be of higher quality than other natural, developed, agricultural, or forest lands under other management regimes. However,

national park lands can be greatly improved for wildlife, and particularly bird use, by restoring processes important for habitat formation, succession, and structural development. Largely, these processes have not been managed historically in the national park system, but current policy allows for active management of species, populations, and lands to provide for long-term conservation of park resources. Protection, restoration, and enhancement of habitats in GUCO can greatly contribute to established habitat goals identified in the Southern Piedmont bird conservation plan.

The park contains mowed fields and flat upland woods of mixed pine and hardwoods, particularly oak species. Much of this habitat provides suitable area and vegetative cover for nesting landbirds, but could be improved through use of habitat restoration and other management techniques to restore the structural complexity of the forests and grasslands in GUCO that are required for many of the high priority bird species that occur there. Specific recommendations are to:

- **consider establishing landscape conditions similar to that following the battle, creating an open oak woodland/native warm season grassland habitat***

- **manage remaining forest acreage to old growth condition**

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

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

Threat Management: The park is subject to a wide range of threats and activities that could negatively impact quantity and quality of habitat for birds and other wildlife. Although these threats are unquantified, adjacent development, vehicular traffic, and exotic plants and animals are believed to be primary threats. The park is encouraged to:

- **work with adjacent landowners and neighbors, the local community, and pubic officials to curb unregulated and free roaming feral cats and domestic dogs in the park (implement the Cat Outdoors program)***

The US Department of Agriculture, Agricultural and Plant Health Inspection Services (APHIS) Wildlife Services unit (WS) is available to provide mammal reduction capability (see contacts). However, live trapping or cats in coordination with the local humane society often provides level of management desired. Cape Hatteras National Seashore has recently completed a feral cat reduction campaign that could be used as a model in GUCO (Altman 2002, Harrison 2002).

Although no significant exotic plants species are negatively impacting habitat at GUCO, it is important to establish and continue inventory and monitoring for exotic plant species. If necessary, consult with regional Exotic Plant Management Team (EPMT) to

remove exotic plant species. Currently, no EPMT provides service the GUCO area. Until an EPMT is established that can provide assistance to GUCO, staff is encouraged to:

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

Additionally, the park is encouraged to:

- **acquire as much land as possible within the authorized boundary**

Research

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

- develop contact with Southern Appalachian Mountains Cooperative Ecosystem Studies Unit (CESU) at the University of Tennessee, Knoxville, TN

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

- **park staff to begin specific consideration of migratory birds during park planning processes**

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

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

Outreach

- **complete the bird checklist for public availability following inventory**

- **consider enhancing visibility of bird conservation issues through organized bird walks, or other organized bird programs**

- **encourage accurate documentation from recreational birding outings (see Cornell University's eBird monitoring program (Cornell Lab. Ornith. 2002 (http://www.ebird.org/about/index.jsp)***

- **develop relationship with T. Gilbert Pearson Audubon Society or Greensboro Bird Club (http://www.greensboro.com/birdclub/) to implement aspects of this plan**

- **develop outreach to adjacent landowners on the importance of park lands to bird conservation and ecology of the area**

- **work with adjacent landowners and neighbors, the local community, and pubic officials to curb unregulated and free roaming feral cats and domestic dogs**

- **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:

- **keep abreast of Guilford County and City of Greensboro initiatives that could impact park resources***

- **cooperate with North Carolina PIF to collaborate on implementation of various aspects of this plan**

- **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 Southern Piedmont bird conservation plan**

- **contact and partner with the T. Gilbert Pearson Audubon Society Greensboro Bird Club to implement various aspects of this 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. Funding for conservation projects for Neotropical migrants is available through the Park Flight program. GUCO is encouraged to enter all high priority projects into the NPS Performance Management Information System (PMIS) database. Needed at GUCO is:

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

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

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

Funding through NAWCA is highly underutilized by the NPS and any park unit that has wetland, water, or bird conservation needs associated with wetland are encouraged to investigate using this funding source. Naturally, there are certain requirements to be eligible for all grants and park managers are encouraged to consult with the nearest Joint Venture, BCR, or PIF Coordinator to learn how this program might be applicable to implementation of this plan, and other park wetland issues. GUCO is not within a region which has an operational Joint Venture, but contact with the Atlantic Coast Joint Venture, Central Hardwoods BCR, and Tennessee PIF coordinators will provide opportunity to investigate use of this funding source and developing proposals.

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.

One largely 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 have 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 $4million and a majority of this funding was directed toward projects in Central and South America.

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

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

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

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

US Fish and Wildlife Service

Keith Watson
Asheville, NC
828-350-8228
Appalachian Mountains
Keith_Watson@fws.gov

Dean Demarest
Nongame Bird Coordinator
Atlanta, GA
404-679-7371
dean_demarest@fws.gov

Chuck Hunter
Regional Refuge Biologist
Atlanta, GA
404-679-7130
Chuck_Hunter@fws.gov

National Park Service

Stephen Ware
Guilford Courthouse NMP
Greensboro, NC
336 288-1776 x224
Stephen_Ware@nps.gov

Raymond Albright
Southern Appalachian Mountains CESU
University of Tennessee
Knoxville, TN
865-974-8443
Ray_Albright@nps.gov

Joe DeVivo
Southeast Coast I&M Network Coordinator
404-562-3113 x739
Joe_DeVivo@nps.gov

Chris Furqueron
Exotic Plant Management Coordinator
404-562-3113 ext 540
Chris_Furqueron@nps.gov

Other

Mark E. Johns
North Carolina Wildlife Resources Commission
Partners In Flight Biologist
919-852-5124
johnsme@mindspring.com

Mr. Walker Golder
North Carolina Audubon
(910) 798-8376
wgolder@audubon.org

Tom Duckwall
T. Gilbert Pearson Audubon Society
Greensboro, NC
104756.404@compuserve.com

Emily Tyler
Piedmont Bird Club
Greensboro, NC
piedmontbirder@aol.com

John F. Heisterberg
USDA APHIS Wildlife Services
North Carolina
(919-786-4480)

LITERATURE CITED

Altman, J. 2002. Feral Cat Management Final Report for Cape Hatteras National Seashore, Wright Brothers National Memorial, and Fort Raleigh National Historic Site. April 15, 2002. 20p.

Barden, L.S. 1997. Historic Prairie in the Piedmont of North and South Carolina, USA. Natural Areas Journal 17:149-152.

Brawn, J.D., S.K. Robinson and F. R. Thomson III. 2001. The Role of Disturbance in the Ecology and Conservation of Birds. Annu. Rev. Ecol. Syst. 32:251-76.

Cooper, R. J. 2000. *Draft* Partners in Flight Southern Piedmont Bird Conservation Plan (Physiographic Area 11). September 2000. University of Georgia. 47p.

Cornell University and National Audubon Society. 2002. eBird Monitoring Program. Cornell University, Laboratory of Ornithology, Ithaca, NY.

Fancy, S. and J. Sauer. 2000. Recommended Methods for Inventorying and Monitoring Landbirds in National Parks. National Park Service, Ft. Collins. 13p.

Harrison, M. 2002. Outer Banks Feral Cat/Cats Indoors Outreach and Education Program. Draft Final Report to Cape Hatteras National Seashore in cooperation with The Nature Conservancy. June 17, 2002. 13p.

Hunter, C. 2000. Bird Population Survey, Inventory, and Monitoring Standards for National Wildlife Refuges and Partners in the Southeastern U.S. USFWS. January 2002. 49p.

Hunter C., D. Buehler, R. Canterbury, J. Confer, and P. Hamel. 2001. Conservation of disturbance-dependent birds in eastern North America. Wildlife Society Bulletin 29:440-455.

Neotropical Migratory Bird Conservation Act. 2000. 114 Stat. 593. 16 U.S.C. 6102 Public Law 106247, enacted July 20, 2000.

North American Wetlands Conservation Act. 1989. 103 Stat. 1968; 16 U.S.C. 4401-4412. Public Law 101-233, enacted December 13, 1989.

Sauer, J.R., J.E. Hines, I. Thomas, J. Fallon, and G. Gough. 2000. The North American Breeding Bird Survey, Results and Analysis 1966-1999. Version 98.1, U.S.G.S. Patuxent Wildlife Research Center, Laurel, MD.

Southeast Natural Resource Leaders Advisory Group (SENRLAG). 2000. A Strategy for Collaboration. Unpublished. 4p.

USDI, Geological Survey. 2001. National Point Count Database. Biological Research Division, Patuxent Wildlife Research Station, Patuxent, MD.

USDI, National Park Service. 1916. Organic Act. 39 Stat. 535 16 U.S.C. 1-4, enacted August 25, 1916.

USDI, National Park Service. 2000. Southeast Coastal Inventory and Monitoring Network Draft Study Plan. December 2000. 148p.

USDI, National Park Service. 2001. National Park Service Management Policies. 2001. December 2000. 137p.

USDI, National Park Service. Resource Management Plan, Guilford Courthouse National Military Park.

USDI, National Park Service. 2002. Park Flight and Migratory Bird Conservation. National Park Service, Natural Resource Program Center. 2p.

US Government. 2000. Presidential Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 2000.

US NABCI Committee. 2000. The North American Bird Conservation Initiative in the United States: A Vision of American Bird Conservation. U.S. NABCI Committee, September 2000. 29p.

Williams, G.W. 2002. Aboriginal Use of Fire: Are There Any “Natural” Plant Communities? USDA Forest Service, Washington D.C., June 2002. 18p.

APPENDIX A

Southern Piedmont Partners in Flight Bird Conservation Plan: Avifaunal Analysis

Entry criteria for identifying priority species, with indications for why the species is considered to be of conservation interest (definitions below).

Priority Entry Criteria[1]	Species	Total PIF Priority Score	Concern Scores: Area Importance	Concern Scores: Population Trend	Percent of BBS Population	Migratory Status[2]	Local Geographical or Historical Notes
Ia.	Bewick's Wren Appalachian subsp.	35	5	5		D	Possibly extinct
	Red-cockaded Woodpecker	29	3	3		RP	Now restricted to GA (?)
	Henslow's Sparrow	28	2	5		B	Presently extirpated (NC,SC) Throughout physio. area
Ib.	Swainson's Warbler	27	3	3	1.0	E	GA(SC along Savannah Riv.)
	Painted Bunting Eastern subsp.	27	2	3		B	GA(SC along Savannah Riv.) Very, very peripheral
	Bachman's Sparrow	27	3	4	3.0	E	GA, SC
	Brown-headed Nuthatch	25	5	3	21.6	R	
	Prairie Warbler	25	5	5	14.6	B	
	Cerulean Warbler	25	2	3		B	Presently extirpated
	Wood Thrush	23	4	3	6.3	B	
	Worm-eating Warbler	23	2	3	1.5	B	
	Whip-poor-will	22	5	3	11.1	B	
	Prothonotary Warbler	22	3	3		B	
	Louisiana Waterthrush	22	3	3	2.4	B	
	Kentucky Warbler	22	3	3	1.8	B	
	Field Sparrow	22	5	5	6.3	D	
II.	Northern Bobwhite	21	4	5		R	
	Red-headed Woodpecker	21	3	5		D	
	Eastern Wood-Pewee	21	5	4		B	
	Loggerhead Shrike	20	3	5		D	
	Summer Tanager	20	5	3	8.5	B	
III.	Chuck-will's-widow	20	4	2	5.5	B	
	Dickcissel	20	2	3		B	

Table 1 (continued).

Priority Entry Criteria[1]	Species	Total PIF Priority Score	Concern Scores: Area Importance	Concern Scores: Population Trend	Percent of BBS Population	Migratory Status[2]	Local Geographical or Historical Notes
IV.	Eastern Meadowlark	18	4	5		D	
	Northern Flicker	17	5	4		D	
	Blue Jay	17	5	5	5.2	D	
	Common Grackle	15	4	5		D	
V.	Pine Warbler	19	5	2	13.3	D	
VI.	Bald Eagle	17	2	3		D	
VII.	Acadian Flycatcher	21	3	3	3.3	B	
	Hooded Warbler	21	3	3	3.2	B	
	Barn Owl	20	2	5[4]		D	
	Black-throated Green Warbler	20	2	3		B	Uwharrie Mountains, NC
	American Kestrel	19	2	5[4]		D	
	Grasshopper Sparrow	19	3	4		D	
	Wild Turkey	17	3	2		R	
	Horned Lark	17	2	5[4]		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.**

II. **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.**

III. **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.**

IV. **Additional Abundant and Declining Species.** **Species AI+PT=9 or 10, not already listed in I, II, or III. Ordered by total score. These are overall low priority species. Among Southeast physiographic areas, Northern Flickers, Common Yellowthroats, Indigo Buntings, and Chipping Sparrows are frequently included under this criterion and though still abundant and widespread these species probably deserve more monitoring attention at a regional or national level. In a number of physiographic areas, however, species meeting this criterion include starlings, grackles, cowbirds, blue jays, and house sparrows, species for which conservation interest is only on how their populations negatively effect higher priority species.**

V. **Additional Species of Area Responsibility.** **Species with high percent of Breeding Bird Survey (BBS) population (>5% in physiographic areas <200,000 km^2, >10% in physiographic areas >200,000 km^2) if not already listed above. Ordered from highest to lowest percentages, also include species with exceptionally high relative abundance (detection rates on BBS routes). These are overall low priority species, but are still designated High Responsibility within physiographic area primarily for general monitoring purposes but little if any directed management action.**

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

VII. **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; numbers in are likely projections; ? 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 (as documented in Appendix __).

APPENDIX B

Southern Piedmont Partners in Flight Bird Conservation Plan: Habitats and Objectives

Once species are grouped into the above tiers (Table 1), then habitats and species suites are identified to look for patterns within and among habitats and species suites, within each physiographic area. Consider using "optimal" and "suitable" designations for habitat as in Hamel (1992). Identify overall level of attention (identified below) and types of actions neede (supplemental action scores as identified in Draft Southeast Species Prioritization document, February 10, 1998).

Priority Habitat	Entry Criteria	Species	Total PIF Priority Score	Concern Scores[1] Area Importance	Population Trend	Breeding Threats	Sum	Conservation Action[2] Survey/ Invent.	Manage.	Monitor.	Resear.	Overall Level	Optimal, Suitable, or Marginal
Grasslands	Ia.	Henslow's Sparrow	28	2	5	5	12	5	5	1	3	V	O
	Ib.	Bachman's Sparrow	27	3	4	4	11	4	3	4	3	II	S
	II.	Northern Bobwhite	21	4	5	3	12	3	2	2	2	III	O
		Loggerhead Shrike	20	3	5	4	12	4	4	4	3	III	O
	III.	Dickcissel	20	2	3	4	9	4	4	1	3	V	M
	IV.	Eastern Meadowlark	18	4	5	3	12	1	3	2	2	III	O
	VII.	Barn Owl	20	2	5[1]	5	12	4	4	5	3	III	O
		American Kestrel	19	2	5[1]	5	12	4	4	5	3	III	O
		Grasshopper Sparrow	19	3	4	4	11	3	4	2	3	III	O
		Horned Lark	17	2	5[1]	4	11	4	4	5	4	V	O
Shrub-scrub	Ia.	Bewick's Wren Appalachian subsp.	35	5	5	5	15	5	5	1	5	V	O
	Ib.	Painted Bunting Eastern subsp.	27	2	3	4	9	5	1	1	3	V	M
		Prairie Warbler	25	5	5	3	13	1	3	2	3	V	O
		Whip-poor-will	22	5	3	3	11	4	3	4	4	V	O
		Field Sparrow	22	5	5	3	13	1	3	2	3	V	O
	II.	Northern Bobwhite	21	4	5	3	12	3	2	2	2	III	S

Table 2 (continued).

Priority Habitat	Entry Criteria	Species	Total PIF Priority Score	Concern Scores[1] Area Importance	Population Trend	Breeding Threats	Sum	Conservation Action[2] Survey/ Invent.	Manage.	Monitor.	Resear.	Overall Level	Optimal, Suitable, or Marginal
Southern Pine/ Pine-Hardwood Mix	Ia. Woodpecker	Red-cockaded	29	3	3	5	11	2	2	3	2	I	S
	Ib.	Bachman's Sparrow	27	3	4	4	11	4	3	4	3	II	O
		Brown-headed Nuthatch	25	5	3	3	11	2	3	2	3	IV	O
		Prairie Warbler	25	5	5	3	13	1	3	2	4	V	S
		Wood Thrush	23	4	3	4	11	2	1	2	3	V	S
		Worm-eating Warbler	23	2	3	3	8	5	3	5	4	V	S?
		Whip-poor-will	22	5	3	3	11	4	3	4	4	V	S
		Field Sparrow	22	5	5	3	13	1	3	2	3	V	O
	II.	Northern Bobwhite	21	4	5	3	12	3	2	2	2	III	O
		Red-headed Woodpecker	21	3	5	3	11	3	3	2	3	III	S
		Eastern Wood-Pewee	21	5	4	3	12	2	3	2	3	III	O
		Loggerhead Shrike	20	3	5	4	12	4	4	4	3	III	M
		Summer Tanager	20	5	3	3	11	2	3	2	2	IV	S
	III.	Chuck-will's-widow	20	4	2	3	9	3	3	4	4	V	O
	IV.	Northern Flicker	17	5	4	3	12	2	3	2	4	V	S
	V.	Pine Warbler	19	5	2	2	9	1	1	2	2	VI	O
	VII.	Hooded Warbler	21	3	3	3	9	3	3	4	3	V	S
		American Kestrel	19	2	5	5	12	4	4	5	3	III	S
		Wild Turkey	17	3	2	2	7	2	2	2	2	VI	S

Table 2 (continued).

Habitat	Priority Entry Criteria	Species	Total PIF Priority Score	Concern Scores[1] Area Importance	Population Trend	Breeding Threats	Sum	Conservation Action[2] Survey/ Invent.	Manage.	Monitor.	Resear.	Overall Level	Optimal, Suitable, or Marginal
Bottomland Forests/ Riparian	Ib.	Swainson's Warbler	27	3	3	4	10	4	4	5	4	V	O
		Painted Bunting Eastern subsp.	27	2	3	4	9	5	1	1	3	V	S
		Cerulean Warbler	25	2	3	4	9	5	5	1	3	V	S
		Wood Thrush	23	4	3	4	11	2	3	2	3	V	O
		Worm-eating Warbler	23	2	3	3	8	5	3	5	4	V	S
		Prothonotary Warbler	22	3	3	3	9	3	4	4	2	III	O
		Louisiana Waterthrush	22	3	3	3	9	3	3	4	3	V	O
		Kentucky Warbler	22	3	3	3	9	3	3	4	3	V	O
	II.	Red-headed Woodpecker	21	3	5	3	11	3	3	2	3	III	S
	VI.	Bald Eagle	17	2	3	3	8	4	2	4	2	IV	S
	VII.	Acadian Flycatcher	21	3	3	3	9	3	3	4	3	V	O
		Hooded Warbler	21	3	3	3	9	3	3	4	3	V	O
		Wild Turkey	17	3	2	2	7	2	2	2	2	VI	S
Upland Hardwoods/ Hardwood-Pine Mix	Ib.	Cerulean Warbler	25	2	3	4	9	5	5	1	3	V	S
		Wood Thrush	23	4	3	4	11	2	3	2	3	V	O
		Worm-eating Warbler	23	2	3	3	8	5	3	5	4	V	S
		Whip-poor-will	22	5	3	3	11	4	3	4	4	V	S
		Kentucky Warbler	22	3	3	3	9	3	3	4	3	V	S
	II.	Eastern Wood-Pewee	21	5	4	3	12	2	3	2	3	III	O
		Summer Tanager	20	5	3	3	11	2	3	2	2	IV	O
	IV.	Northern Flicker	17	5	4	3	12	2	3	2	4	V	S
	VII.	Acadian Flycatcher	21	3	3	3	9	3	3	4	3	V	S
		Hooded Warbler	21	3	3	3	9	3	3	4	3	V	O
		Black-throated Green Warbler	20	2	3	4	9	5	3	5	5	V	S?
		Wild Turkey	17	3	2	2	7	2	2	2	2	VI	S

[1]AI or PT score revised from what was derived by BBS data, or lack thereof, based on better local information (as documented in Appendix __); TB scores locally modified are indicated by underlining score.

[2]The level of conservation action is identified by the following criteria:

SUPPLEMENTAL ACTION SCORES FOR IDENTIFYING SPECIFIC CONSERVATION ACTIONS FOR PRIORITY SPECIES

CRITERIA	EXPLANATION
SURVEY/INVENTORY SCORE	HOW RELIABLE ARE DATA MEASURING DISTRIBUTION AND HABITAT ASSOCIATION? HIGHER SCORES EQUATE TO MORE DATA NEEDED.
5	Distribution and habitat association is extrapolated from a few localities or knowledge limited to general range maps.
4	Some range limits or habitat associations are known, but local and regional occurrences cannot be predicted accurately.
3	Broad range limits or habitat associations are known, but local occurrences cannot be predicted accurately.
2	Distribution and habitat associations are generally well known and occurrences can be accurately predicted most of the time throughout range.
1	Distribution and habitat associations are well known and occurrences can be accurately predicted throughout the range.
MANAGEMENT SCORE	IS THERE A NEED FOR A GREATER LEVEL OF MANAGEMENT ATTENTION? HIGHER SCORES EQUATE TO MORE MANAGEMENT NEEDED.
5	None or little directed at species, but management needed.
4	Management mostly related to enforcement of conservation laws, deemed inadequate to ensure population security
3	Some direct or indirect (habitat or ecosystem level) management activities in addition to enforcement of conservation laws and should be continued.
2	Direct management intensively applied to taxon, some additional attention may be needed.
1	None directed at species, with little perceived need.

SUPPLEMENTAL ACTION SCORES FOR IDENTIFYING SPECIFIC CONSERVATION ACTIONS FOR PRIORITY SPECIES (CONT.)

CRITERIA	EXPLANATION
MONITORING SCORE	**HOW RELIABLE ARE DATA MEASURING POPULATION CHANGE? HIGHER SCORES EQUATE TO MORE MONITORING ATTENTION NEEDED.**
5	**Population trends not currently monitored, but monitoring needed.**
4	**Area wide monitoring ongoing, but not with statistical sensitivity.**
3	**Monitored locally with statistical sensitivity, but not area wide.**
2	**Area wide monitoring with minimum sample size for statistical sensitivity.**
1	**Area wide monitoring with statistical sensitivity, nearly complete census, or area wide monitoring deemed unnecessary.**
RESEARCH SCORE	**HOW WELL UNDERSTOOD ARE FACTORS DETERMINING LIMITS IN POPULATION SIZE AND DISTRIBUTION? HIGHER SCORES EQUATE TO MORE RESEARCH NEEDED.**
5	**Factors affecting population size and distribution, necessary for effective management, are unknown or unsubstantiated.**
4	**A few factors affecting population size and distribution are known, but 1 or more factors are unknown hindering management efforts.**
3	**Some factors affecting population size and distribution are known allowing for some effective management, but 1 or more important factors remain unknown.**
2	**Most major factors affecting population size and distribution are known allowing for reasonably effective management.**
1	**All major factors affecting population size and distribution are known or there is little perceived need to discover these factors.**

Overall Level of needed conservation action is defined as follows:

1. Crisis recovery(*e.g.*, many but not all endangered species or otherwise non-listed but extremely vulnerable species).

2. Immediate management and/or policy action needed for population stabilization, part of range wide effort (*e.g.*, Bachman's Sparrow, Golden-winged Warbler, Cerulean Warbler).

3. Management to reverse, stabilize, or increase populations in the physiographic area (*e.g.*, Brown-headed Nuthatch, Painted Bunting, Bicknell's Thrush).

4. Long-term planning and responsibility in the physiographic area (*e.g.*, monitoring species with high percent of BBS population, with unclear or stable population trends).

5. Investigations (Survey/Inventory or Research) to better determine status or level of threat (*e.g.*, high scoring but poorly monitored species such as Swallow-tailed Kite, Henslow's Sparrow, Swainson's Warbler, Southern Appalachian populations of boreal forest birds).

6. Monitor potentially encouraging population trends or expansions (*e.g.*, Swainson's Hawk, Prothonotary Warbler, Worm-eating Warbler).

Table 3 (under each habitat discussion in Section 3) . Determine status of habitat availability:

1. Identify threats.

2. Land use patterns.

3. Management options.

4. Conservation issues (including potential conflicts with other high priority habitats or species suites).

Table 4 (also within Section 3 under each habitat discussion). Biological requirements of each species within each suite (*i.e.*, microhabitat requirements necessary for setting population objectives), identify focal (umbrella) species, and prioritize actions for habitat.

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 (Avery, Buncombe, Haywood, Jackson, Mitchell, Swain, Transylvania, Watauga, Yancey)	Brown Creeper	SC	-	S3B,S5N	G5

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

Scientific Name Province: Habitat (Counties of occurrence)	Common Name	Status N.C.	Rank U.S.	N.C. Global
Northampton, Polk, Rutherford, Transylvania, Watauga, Wilkes)				
Dendroica magnolia M: spruce-fir forests, especially in immature stands [breeding season only] (Avery, Buncombe, Graham, Haywood, Jackson*, McDowell, Mitchell, Watauga, Yancey)	Magnolia Warbler	SR -	S1S2B,SZN,	G5
Dendroica virens waynei 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)	Black-throated Green Warbler - Coastal Plain population	SR -	S3B,SZN	G5TU
Egretta caerulea T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Columbus*, Cumberland, Currituck, Dare, Hyde, Jones, New Hanover, Robeson)	Little Blue Heron	SC -	S3B,S3N	G5
Egretta thula T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Columbus*, Currituck, Dare, Hyde, New Hanover, Robeson)	Snowy Egret	SC -	S3B,S3N	G5
Egretta tricolor T: forests or thickets on maritime islands [breeding sites only] (Brunswick, Carteret, Currituck, Dare, Hyde, New Hanover)	Tricolored Heron	SC -	S3B,S3N	G5
Empidonax alnorum M: high elevation shrub/sapling thicket [breeding season only] (Alleghany, Ashe, Avery, Buncombe, Haywood, Jackson, Mitchell, Watauga, Yancey)	Alder Flycatcher	SR -	S2B,SZN	G5
Falco peregrinus 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)	Peregrine Falcon	E -	S1B,S2N	G4
Haematopus palliatus T: estuaries, oyster beds, mudflats [breeding evidence only] (records not yet entered)	American Oystercatcher	SR -	S3B,S4N	G5

Common Name	Status	Rank			
Province: Habitat (Counties of occurrence)			N.C.	U.S.	
N.C. Global					
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, 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)					

Common Name	Status	Rank			
Province: Habitat (Counties of occurrence)			N.C.	U.S.	
N.C. Global					
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 [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*)					

Common Name Province: Habitat (Counties of occurrence)		Status		Rank N.C.	U.S. N.C.	Global
Pooecetes gramineus M: high elevation pastures and grassy fields [breeding season only] (Ashe, Avery, Haywood, Mitchell, Watauga)	Vesper Sparrow	SR	-	S2B,S2N		G5
Porphyrula martinica C: freshwater ponds with floating vegetation [breeding sites only] (Brunswick, Onslow*, Robeson)	Purple Gallinule	SR	-	SHB		G5
Riparia riparia MP: high, vertical banks for nesting [breeding sites only] (Avery, Wilkes*)	Bank Swallow	SR	-	SUB,SZN		G5
Rynchops niger T: sand flats on maritime islands [breeding sites only] (Brunswick, Carteret, Dare, Hyde, New Hanover, Onslow, Pender)	Black Skimmer	SC	-	S3B,S3N		G5
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

Common Name Province: Habitat (Counties of occurrence)		Status	Rank	N.C.	U.S. N.C.	Global
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.

Accipiter cooperii MPSC: forests and woodlands	Cooper's Hawk	SC	-	S3S4B,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

Common Name Province: Habitat (Counties of occurrence)		Status		Rank N.C.		N.C.	U.S. N.C.	Global
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
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

Common Name	Status	Rank			
Province: Habitat (Counties of occurrence)				N.C.	U.S. N.C. Global
Spiza americana	Dickcissel	W3,W5	-	S2B,SZN	G5
PC: fallow fields and pastures with tall forbs					
Sterna forsteri	Forster's Tern	W2	-	S3B,S5N	G5
T: salt or brackish marshes, nesting on wrack material or matted grasses					
Sterna fuscata	Sooty Tern	W2	-	SUB,S3N	G5
T: sand flats on maritime islands; forages over open ocean					
Sterna sandvicensis	Sandwich Tern	W2,W5	-	S3B,SZN	G5
T: sand flats on maritime islands					
Tachycineta bicolor	Tree Swallow	W2	-	S2S3B,S4N	G5
MPC: cavities near ponds or other open water					
Troglodytes troglodytes	Winter Wren	W2,W5	-	S3B,S5N	G5
M: cool, moist forests at mid- to high elevations					
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 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 [also known as Species at Risk]	"... the Service is discontinuing the designation of Category 2 species as candidates in this notice. The Service remains concerned about these 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

STATUS CODE	STATUS	DEFINITION
		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 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.

RANK	NUMBER OF EXTANT POPULATIONS	DESCRIPTION
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.
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 Protected List, biologists consider the species to no longer need tracking by the N.C. Natural Heritage Program.

APPENDIX D

US Fish and Wildlife Service Species of Conservation Concern (2002) in the Piedmont (BCR 29)

Peregrine Falcon
Black Rail
Upland Sandpiper
Chuck-will's-widow
Whip-poor-will
Bewick's Wren
Wood Thrush
Prairie Warbler
Cerulean Warbler
Prothonotary Warbler
Swainson's Warbler
Kentucky Warbler
Bachman's Sparrow
Henslow's Sparrow
Rusty Blackbird