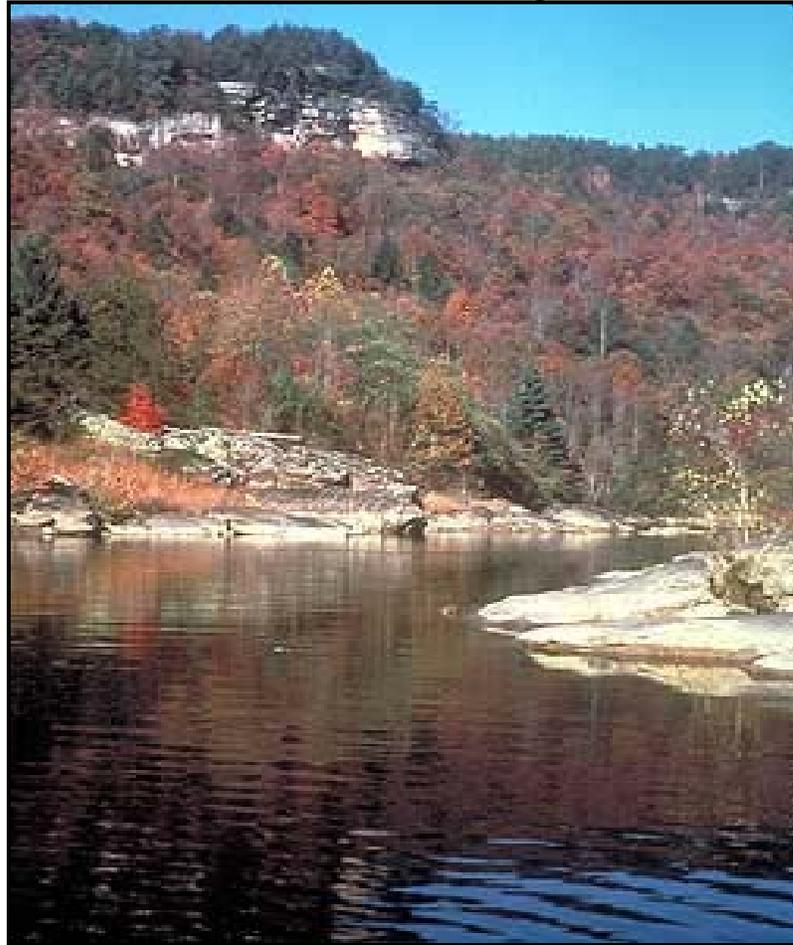


FINAL DRAFT

Avian Conservation Implementation Plan
Big South Fork National River and
Recreation Area

National Park Service
Southeast Region



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U.S. Fish and Wildlife Service
In cooperation with

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

This Avian Conservation Implementation Plan (ACIP) is provided to the staff at Big South Fork National River and Recreation Area (BISO) to help identify and prioritize bird conservation opportunities, and to provide information and guidance for the successful implementation of needed conservation activities. This plan may identify goals, strategies, partnerships, and perhaps specific projects for the park to participate in existing bird conservation planning and implementation efforts associated with the North American Bird Conservation Initiative (NABCI). Under the auspice of NABCI, appropriate bird and habitat conservation goals may be recommended as identified in the appropriate existing national or regional bird conservation efforts aligned with this initiative: Partners In Flight (PIF), North American Waterfowl Management Plan (NAWMP), US Shorebird Conservation Plan (USSCP), and Waterbird Conservation for the Americas (WCA). For example, parks in the Appalachians and the Cumberland Plateau, including BISO, 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 most of the parks in the Appalachians are located in and are primarily upland forested landscapes, 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 BISO will be discussed and integrated as appropriate.

Information and data presented in the ACIP have been obtained from several sources: 1) interviews with BISO staff 2) BISO bird conservation partners 3) the PIF Northern Cumberland Plateau Bird Conservation Plan, Version 1.0 (Anderson et al. 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 BISO resource management staff and managers, Appalachian Highland Network Inventory and Monitoring (AHN I&M) staff, and bird conservation partners and approved by BISO management. Optimally, this plan will be incorporated into the park's Resource Management Plan (RMP) and updated annually to reflect completed projects, newly identified needs, and shifts in bird conservation priorities in the region.

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

Background

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

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

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

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

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

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

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

The Southeastern Bird Conservation Initiative- National Park Service: In 1999, the Southeast Region of the National Park Service (NPS) recognized the importance of

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

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

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

This ACIP fulfills one aspect of the plan outlined above, and serves as a basis for future bird conservation actions in BISO 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 (Congaree Swamp National Monument, Ocmulgee National Monument), and others such as the Blue Ridge Parkway, Obed Wild and Scenic River, and Timicuan Ecological and Historic Preserve.

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

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

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

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

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

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

Mining, agriculture, and logging practices of the early 20th century stripped much of the Cumberland Plateau of its marketable trees and readily-accessible coal. BISO was created in 1974 as an effort to curtail the effects that these practices were having on the landscape, to provide economic and recreational opportunities for the region, and to maintain the Big South Fork of the Cumberland River as a free-flowing river (www.nps.gov/biso). The Big South Fork and its tributaries pass through 144 km of scenic gorges and valleys containing a wide range of natural and historic features (Nichols et al. 2000). BISO is within the Partners in Flight physiographic area known as the Northern Cumberland Plateau (Figure 1) and lies within portions of Tennessee and Kentucky.

This 50,586 ha (125,000 acre) site now is lush with second-growth forest concealing old homesteads, mining entrances, and logging roads. There are numerous man-made ponds. Much of the park consists of a massive gorge carved into the Cumberland Plateau by the Big South Fork. Upstream topography is characterized by dendritic drainages that form narrow v-

shaped gorges. Downstream, sheer bluffs dominate the gorge rim, towering over mixed-hardwood talus slopes and the river floodplain below, which is typified by river birch and American sycamore. The area above the gorge is relatively flat and is dominated by oak species, hickory species, and red maple, with Virginia pine being common on dry ridges and cliff edges (recent southern pine beetle) outbreaks have killed much of the Virginia pine). Mountain laurel is common in the understories of these dry forests. Mesic ravines contain large components of American beech, sugar maple, and yellow birch. Eastern hemlock and *Rhododendron* are common along narrow gorges and small streams (Nichols et al. 2000).

Avian Resources of the Northern Cumberland Plateau

The Northern Cumberland Plateau covers over 5,000,000 ha in parts of West Virginia, Virginia, Kentucky, Tennessee, Alabama, and Georgia. The physiographic area is heavily forested; about 90% of the land use is classified as forest cover of different forest types and successional stages. However, oak-hickory forests dominate and occupy as much as 66% of the landscape. Important bird habitats include hardwood forests (including oak-hickory, Appalachian oak, mixed pine-hardwood, cove hardwoods, and northern hardwoods), hemlock-white pine, mountain yellow pine, riparian woodlots, grasslands, scrub-shrub habitats, and short rotation pine.

Over 150 bird species nest in the Northern Cumberland Plateau physiographic area. The most widely distributed species include Indigo Bunting, Red-eyed Vireo, Ovenbird, and Northern Cardinal. The Cerulean Warbler, Golden-winged Warbler, and the Appalachian subspecies of the Bewick's Wren (possibly extirpated) are among the most rapidly declining and vulnerable species. The Red-cockaded Woodpecker has been extirpated from the BISO (and from all of Tennessee and Kentucky). Fairly common birds also experiencing continental population declines include Acadian Flycatcher, Wood Thrush Worm-eating, Warbler Kentucky Warbler and Hooded Warbler (Anderson et al. 2000).

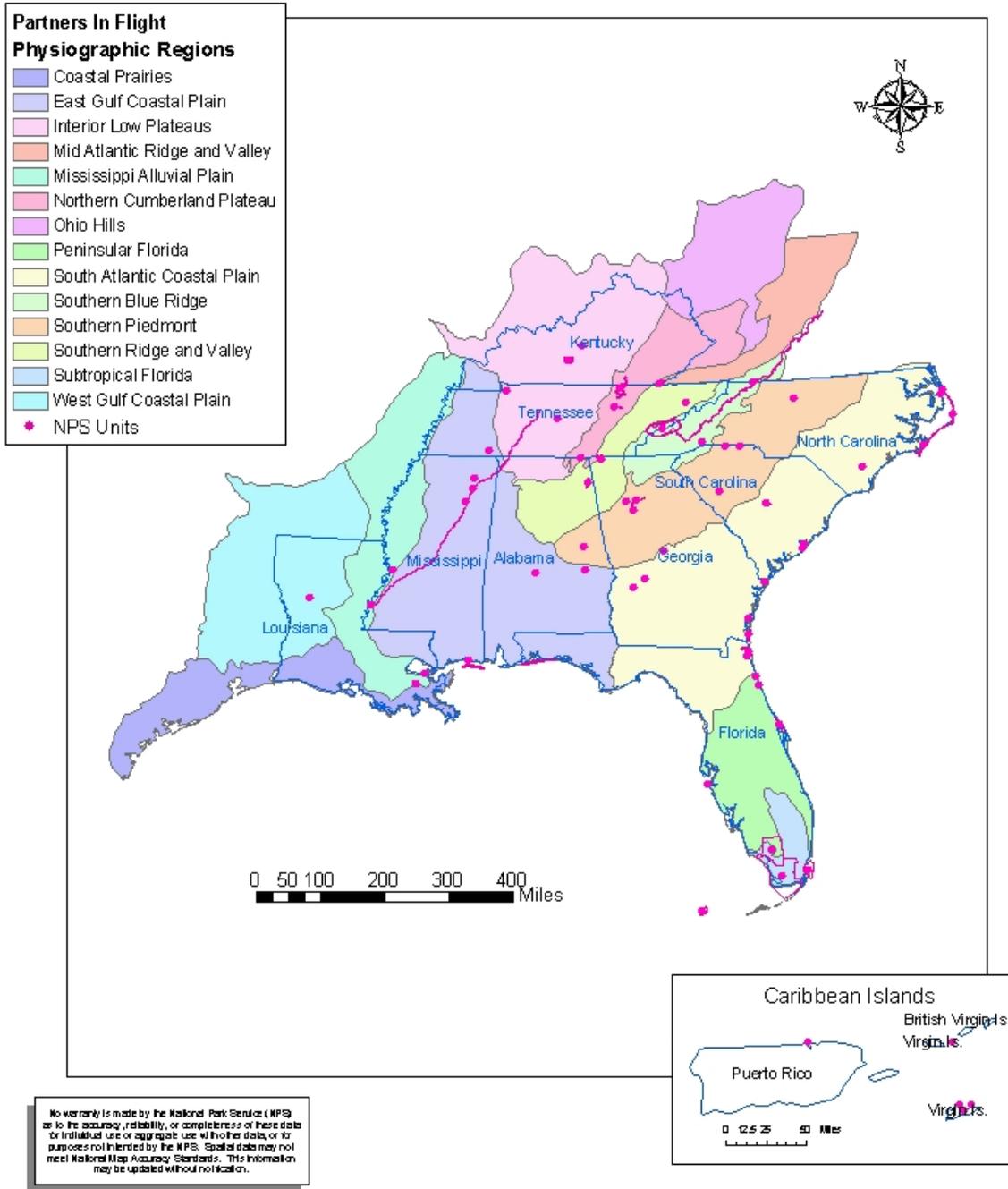
In the Northern Cumberland Plateau, the primary bird conservation objectives are to stabilize and/or increase populations of high priority bird species. In order to reach these goals, habitat objectives designed to improve conditions for birds in the region include the following:

1. actively manage at least 80%, or about 25,000 ha, of all hemlock–white pine stands for long rotation or old growth conditions,
2. increase fire as a management action in all stands of mountain yellow pine on public lands,
3. manage for and maintain the forest acreage and tract size distribution that currently exists in the area (about 4,000,000 ha), with about 85% in hardwood or mixed pine-hardwood forest and 15% in short rotation pine habitats,
4. actively manage at least 500,000 ha within this context for long rotation sawtimber or old growth conditions, and

Partners in Flight (PIF) Regions

Southeast Region (SER)

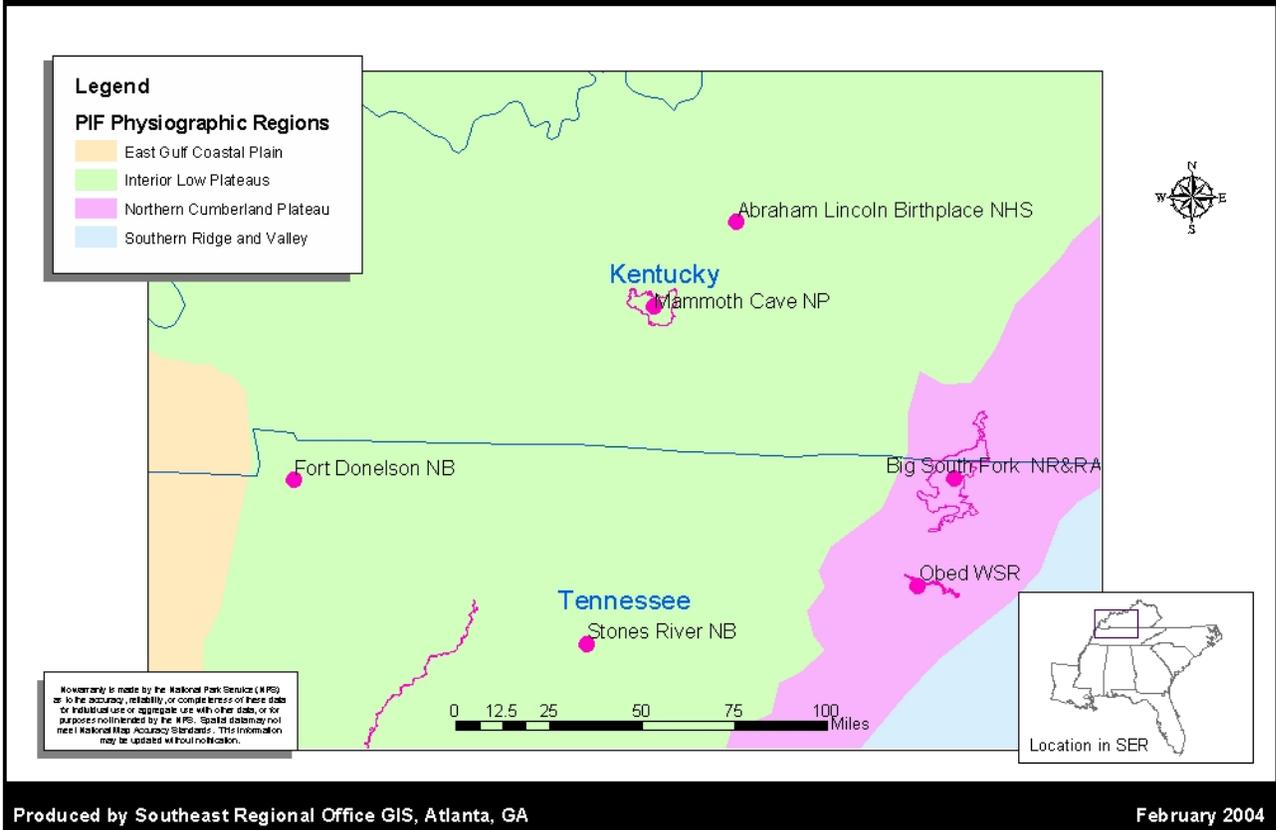
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Partners in Flight (PIF) Regions and NPS Locations

Southeast Region (SER)

National Park Service
U.S. Department of the Interior



5. manage for at least 4,000 ha of managed warm season grasslands and 12,000 ha of scrub-shrub habitats.

The vast majority of bird conservation recommendations in the Northern Cumberland Plateau bird conservation plan can be integrated into existing NPS programs including habitat restoration, fire management, exotic species management, and interpretation and education programs (see Integration of NABCI Goals and Objectives into Park Planning and Operations later in this ACIP).

Avian Conservation in BISO

Avian Biodiversity: BISO has an avian inventory and a checklist of birds that is available for the public. Managers recognize the need to update the inventory and checklist and plans are underway to conduct both. Stedman and Stedman (2002) have documented 159 species throughout the park, 94 of which are breeders, and an additional 10 species that were former residents that have now been extirpated from the region. These numbers equal the regional

estimate of breeding birds for the Northern Cumberland Plateau. Additional records were obtained from the Atlas of the Breeding Birds of Tennessee (Nicholson 1997).

Verified records of birds in BISO 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 and consultants have not identified any particular species that is a park management concern or high priority for conservation. Rather, park staff are concerned about conserving all birds and their habitats in BISO. However, several species that occur in BISO are high priority on the Northern Cumberland Plateau and conservation efforts in the park could focus on these species or groups of species. Cerulean Warbler and Swainson's Warblers (*Limnothylops swainsonii*) are two of these species, among many others of conservation concern. Cerulean and Swainson's Warblers have been recognized as species in decline or important to bird conservation in the region (Anderson et al. 2000).

Inventory: A complete inventory has been recognized as important information for park managers and is being conducted within the framework of the NPS I&M Program. BISO is one of four parks in the NPS Appalachian Highlands I&M Network for which a plan to conduct high priority inventory projects has been prepared (Nichols et al. 2000). A request for proposals to complete the inventory was released in March of 2003 and work is expected to begin in spring of 2004. Dr. Stephen Stedman, Tennessee Technological University, and Ms. Barbara Stedman are presently conducting avian inventory and monitoring throughout BISO in conjunction with the I&M plan and through personal interest in bird conservation in the park. Although the BISO avian inventory is considered complete in relation to the NPS's I&M goals, additional inventory will be conducted to determine breeding bird distribution and relative abundance in 1 ha plots associated with vegetation plots established for the vegetative inventory described in the inventory plan (N. Murdock personal communication, Nichols et al. 2000).

Several high priority PIF species for the Northern Cumberland Plateau occur in BISO (see below and Appendixes B and C). Prominent among these species are: Swainson's Warbler, Cerulean Warbler, Worm-eating Warbler, Louisiana Waterthrush, Kentucky Warbler, Prairie Warbler, Wood Thrush, and Acadian Flycatcher. For a complete listing of birds documented in the park, see Stedman and Stedman (2002).

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

- Four Breeding Bird Survey (BBS) routes are established in the park and are surveyed each spring by the Stedmans (100 points)
- Night Survey to detect Barred Owls (*Strix varia*) and Whip-poor-wills (18 stops in 1994-1996 and 30 stops in 1997-2002)

- Night Survey to detect Northern Saw-whet Owl (varied in number of stops in four winters and two years has 100 stops)
- Spring and fall migration monitoring conducted on seven walking transects

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

Threatened and Endangered Species: No Federally listed threatened or endangered species occur in BISO. The Federally endangered Red-cockaded Woodpecker has been extirpated from BISO (and from all of Tennessee and Kentucky). Also extirpated from the region in the mid-1950's, the American Peregrine Falcon (*Falco peregrinus anatum*) (now de-listed) may occur within BISO among the extensive cliff ledges at the site. However, systematic surveys have not been conducted to determine presence of nesting Peregrine Falcons. Stedman and Stedman (pers. comm.) believe their work in the park covers appropriate timing and area for potential nests, and none have been detected.

Several Watch-Listed in Tennessee species occur in BISO including American Woodcock and Pine Warbler. Additionally, Cerulean and Swainson's Warblers and many other bird species on the Tennessee Natural Heritage Program's Tracked in Tennessee list occur in the park (<http://www.state.tn.us/environment/nh/vert.htm>) (Appendix D). Many Kentucky threatened and endangered species occur in the park (Appendix E) and their conservation should be coordinated with appropriate state personnel (see Contacts). Setting priorities for bird conservation presents some unique challenges because the park lies within the State of Tennessee and the Commonwealth of Kentucky.

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

Park Identified Needs for Avian Conservation

BISO has identified at least three projects that would increase the avian knowledge of the park.

Inventory: The highest priority is to **complete the breeding bird inventory as identified in the I&M plan.**

Monitoring: Forest point counts are planned to be conducted along ecologically unique routes beginning in 2004.

Data Management: The highest priority is to **verify and enter avian observational data into NPSpecies.**

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, BISO is within the NABCI Appalachian BCR which extends from New York to Georgia (see NABCI BCR map

below) and encompasses several PIF physiographic areas (the planning unit for PIF)(compare to PIF map).

Several NABCI BCR's have coordinators whose primary responsibility is to coordinate all bird conservation planning in the BCR, across all agencies and organizations. Currently, the Appalachian BCR does not have a designated coordinator; however, a bird conservation coordinator for the southern Appalachians that includes several PIF physiographic areas (Southern Blue Ridge, Southern Ridge and Valley, Northern Cumberland Plateau) has been established (see contacts below) and can provide valuable assistance to BISO with implementation of aspects of this ACIP. Active bird conservation planning is underway in the adjacent Central Hardwoods BCR (see contacts below) and communications with this coordinator will be important to fully assess the park's role in regional and landscape scale bird conservation.

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 Northern Cumberland Plateau can be found in the draft bird conservation plan, previously submitted to the park. A revised version of this plan should be available in the near future and may be substantially different from the current format; however, bird and habitat conservation priorities are not likely to be significantly changed. The park will receive updates of the plan as they are completed. The current plan identifies priority bird and habitat conservation goals that must be implemented in order to achieve bird conservation success in this region. BISO being largely a landbird park will utilize this plan more than any other plan to participate in NABCI implementation.

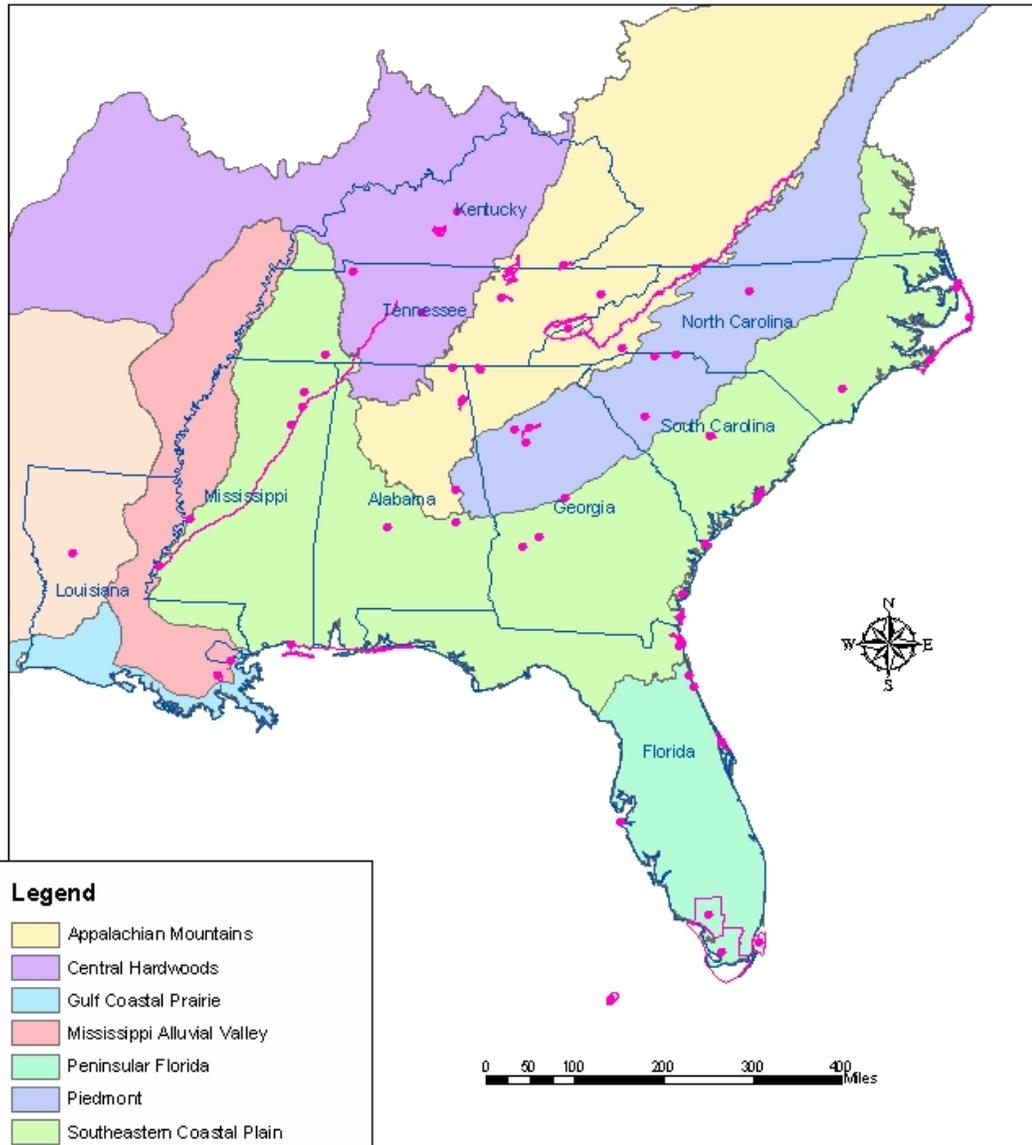
Similar to NABCI BCR's, PIF physiographic areas often do not have designated coordinators. However, state level non-game agencies with investment in PIF will establish key personnel to develop partnerships among cooperators in the physiographic area. The State of Tennessee and the Commonwealth of Kentucky each have a PIF coordinator and can be instrumental in assisting BISO to implement recommendations identified in this ACIP and projects important to bird conservation relative to Tennessee and Kentucky's role in implementation of the Northern Cumberland Plateau 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 2003. Since BISO has little habitat of regional importance to shorebird conservation, recommendations for shorebird conservation are not presented.

Bird Conservation Regions

Southeast Region (SER)

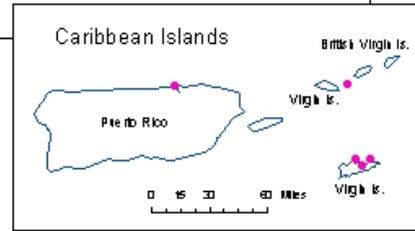
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Legend

- 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 without 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.



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 Northern Cumberland Plateau and none are presented here for BISO.

Integration of NABCI Goals and Objectives into Park Planning and Operations: NABCI Implementation Recommendations

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

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

To the extent appropriate, each of these program areas will be discussed separately and within each, specific opportunities identified that, when implemented, will enable to park to meet its mandates (current and expected) as well as integrate NABCI into its planning and operations. With emphasis added, the park is not expected to implement any of these recommendations or be obligated to pursue any opportunity other than those the park is required to do by law or NPS program or policy. In other words, participation in this effort is currently voluntary. However, participation in these efforts at some level could become mandatory with the completion of an MOU with the FWS regarding EO 13186 (US Government 2000). The MOU will establish a formal agreement between the FWS and the NPS to promote bird conservation within the agency by incorporating goals and strategies of existing bird conservation initiatives, plans, and goals into park planning and operations.

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

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

Inventory: The park has inventoried its bird fauna exceptionally well. Although the avifauna of BISO is well documented, distribution and abundance data are desired to fully understand the status of birds in the park so that conservation actions for birds can be implemented (N. Murdock personal communication, Nichols et al. 2000). Information regarding the status of high priority species (as identified in the Northern Cumberland Plateau bird conservation plan, the Tennessee Wildlife Resources Commission Threatened and Endangered Species list, and the Endangered, Threatened, Special Concern, and Historical Biota of Kentucky), is needed to effectively structure park management for the continued preservation and enhancement of the park's avifauna.

Additional surveys are needed:

- **along river corridor cliff areas for cliff nesting species such as Peregrine Falcon, other raptors, and swallows**
- **for High Priority forest and shrub-scrub species that may not be adequately surveyed with existing or planned inventory efforts (e.g. Swainson's Warbler, Cerulean Warbler, and Bewick's Wren)**
- **along stream corridors for high priority riparian species such as Louisiana Waterthrush, Acadian Flycatcher, Spotted Sandpiper (*Actitis macularia*), and Wood Duck (*Aix sponsa*)**
- **at established forest point counts in winter**

Additionally, BISO is encouraged to

- **partner with Daniel Boone National Forest staff to coordinate area inventory efforts**
- **verify other avian observational data collected in the park and enter into the appropriate database (NPSpecies, Tennessee Wildlife Resources Agency [TWRA])**
- **standardize inventory methodology as needed to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000).**

Monitoring: The park's active monitoring program has documented the presence of many high priority species of regional conservation concern. Efforts should be made to continue existing monitoring programs, striving to conform to established NPS or FWS surveys protocols. The park should consider establishing permanent monitoring stations (e.g. point counts, etc.) 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 adjacent BCR coordinators and the Tennessee and Kentucky PIF coordinators 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:

- **continue to conduct existing monitoring programs and enter data into the appropriate database (NPSpecies, TWRA, or National Point Count Database (USGS 2001) (<http://www.mp2-pwrc.usgs.gov/point/>)**
- **establish point counts along ecologically distinct or vegetative/habitat types**
- **standardize monitoring methodologies as needed to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000).**
- **partner with Daniel Boone National Forest staff to coordinate area monitoring efforts**
- establish point counts in early successional habitats (created by outbreaks of southern pine beetle, ice storms, and wind storms) to document use by high priority species
- establish point counts in Eastern Hemlock dominated areas to establish baseline data to measure changes and potential impact to birds from decline of Eastern Hemlock

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 (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 BISO 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 BISO can greatly contribute to established habitat goals identified in the Northern Cumberland Plateau bird conservation plan.

The park is largely an upland mixed hardwood pine forest with oak and pine dominating the plateau shelf, mixed mesophytic species occurring along stream banks and gorges and riparian species along river courses. Much of this habitat provides suitable area and vegetative cover for nesting landbirds, but could be improved through use of prescribed fire and forest thinning to restore the structural complexity of the forests in BISO that are required for many of the high priority bird species that occur there. Specific recommendations are to:

- **work toward optimization of habitat structure for Swainson's Warbler and other dense understory nesting wood warblers through prescribed fire where appropriate, and potentially other forest management practices* (Rodewald and Smith 1998)**
- **manage forests toward old growth conditions, implementing appropriate management techniques to develop desired understory structure for high priority birds***
- **identify and protect cliff areas where birds nest**
- **protect existing snag trees, where not identified as a safety hazard, as important to cavity nesting birds**
- **document all major habitat management activities, including information such as location (e.g. on map or with UTM coordinates), and a description of methods and of pre- and post-management habitat conditions. This information, when coupled with bird distribution and abundance data, is useful for assessing and replicating conservation actions**
- enhance water quality to support aquatic biota necessary to support existing riparian corridor nesting birds and birds that use the riparian corridor for foraging
- assess historic landscape cover and determine feasibility of restoring landscape within the context of the park's enabling legislation.

Threat Management: Potentially the greatest impact to birds at BISO is the use of off-road vehicles and horseback riders in areas that potentially damage habitat and disturb nesting birds (S. Stedman personal communication). The park is encouraged to:

- **manage these uses by limiting their use on designated roads and trails.**

Habitat fragmentation in the park and surrounding areas is also a potential threat to birds in the park. The park is encouraged to:

- **work with the local community and other land conservation interests in the region to minimize habitat fragmentation and potentially restore habitats beneficial to wildlife and bird species of the region**

Impact of exotic species on birds at BISO is largely unquantified, yet several domestic and exotic mammals occur in the park and may damage birds directly through predation or habitat alteration. Feral hogs, domestic and feral dogs and cats. Park managers are encouraged to:

- **cooperate with Daniel Boone National Forest managers and local landowners to consider various methods to reduce the hog population.**

The US Department of Agriculture, Agricultural and Plant Health Inspection Services (APHIS) Wildlife Services unit (WS) is available to provide feral hog reduction capability (see contacts). Additionally, feral hog reduction advice is available through other NPS units that have experienced feral hog reduction programs, especially Great Smoky Mountains National Park. Feral and domestic dogs and cats are also considered a disturbance to birds in BISO. The park is encouraged:

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

Cape Hatteras National Seashore has recently completed a feral cat reduction campaign that could be used as a model in BISO (Altman 2002, Harrison 2002).

Although no significant exotic plants species are negatively impacting habitat at BISO, 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 BISO area. Until an EPMT is established that can provide assistance to BISO, staff is directed to consult with the regional pest management specialist (see contacts).

Research:

- **determine distribution and abundance for Cerulean Warbler and compare to other Cumberland Plateau areas (in partnership with other agencies in the region)***
- **assess feasibility of reintroduction of extirpated species, especially the Red-cockaded Woodpecker**

- **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.
- determine influx and impact of Brown-headed Cowbirds (*Molothrus ater*) from adjacent lands and potential impacts on nesting priority species

Compliance: Park compliance with the Migratory Bird Treaty Act and EO 13186 (US Government 2000) is necessary to assure that park activities incorporate bird conservation into park planning and operations. Further, to ensure that migratory birds are considered in all phases of park planning processes, especially during the National Environmental Policy Act (NEPA) and the Director's Order #12 Compliance processes, the park should consider adding specific language in project evaluations that requires consideration and implications of park projects on migratory birds. The MOU being developed between the NPS and the FWS will likely contain specific language requiring a park to consider implications of park projects on migratory birds. 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 (US Government 2000) at the National Conservation Training Center (NCTC) (when available) or other training on migratory bird conservation in North America. NCTC has several courses and training related to conservation of migratory birds (<http://training.fws.gov/courses.html>).

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

Outreach:

- **participate in International Migratory Bird Day (IMBD) events with a local partner (<http://birds.fws.gov/imbd.html>)**
- **nominate BISO as an Important Bird Area (<http://www.abcbirds.org/iba/nominstr.htm>)**
- **encourage development of outreach and educational programs to enhance visibility of bird conservation issues, which may include organized bird walks, owl prowls, and raptor surveys with the public**

- **encourage accurate documentation and reporting from these and random outings by visitors (see Cornell University's eBird monitoring program (Cornell Lab. Ornith. 2002 (<http://www.ebird.org/about/index.jsp>))**
- **update the bird checklist for public availability**
- **work with adjacent landowners and neighbors, the local community, and public officials to curb unregulated and free roaming feral and domestic dogs and cats in the park**
- park interpretation/education staff are encouraged to attend USFWS training on Migratory Bird Education at NCTC
- consider adding links to bird conservation information, data, etc. to the park's web site home page
- support bird conservation by serving shade-grown coffees at meetings, events, and the office buildings in the park (<http://www.americanbirding.org/programs/consbcof3.htm>)
- subscribe to TN-Bird Net, an electronic forum for listing bird sightings and publications in Tennessee.
- subscribe to BIRDFOLK messages from Dr. Stephen Stedman, an electronic forum for learning about matters of interest regarding birds of the Upper Cumberland Region. To receive BIRDFOLK contact Dr. Stedman at sstedman@tntech.edu
- explore cultural affiliation of landscape to inhabitants, both historical and contemporary. Cultures are strongly tied to the landscape they inhabit and birds often play a role in a cultural tie to the landscape. When these connections are discovered and preserved, a greater appreciation for the landscape and its value to the culture can be achieved.

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 Scott, Pickett, Fentress, and Morgan Counties, Tennessee and McCreary County, Kentucky initiatives that could impact park resources**
- **continue to develop and strengthen relationship with Ms. Barbara and Dr. Stephen Stedman to coordinate and conduct park bird conservation projects**
- **contact US Fish and Wildlife Service private lands biologists to discuss private landowner initiatives applicable to the area**

Several private landowner programs could be implemented that would serve to protect areas adjacent to BISO and potentially improve water and habitat quality in the vicinity

- **develop partnership with Tennessee Wildlife Resources Commission, Kentucky Department of Fish and Wildlife Resources, and Daniel Boone National Forest (DBNF) staffs**
- **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 Northern Cumberland Plateau bird conservation plan**
- conduct joint raptor surveys for cliff nesting species with Big South Fork National River and Recreation Area, Cumberland Gap National Historic Site, Great Smoky Mountains National Park, States of Tennessee and Kentucky, and DBNF. The DBNF has an active Peregrine Falcon reintroduction program that could potentially lead to establishment of Peregrine Falcons on the Tennessee Cumberland Plateau
- contact and partner with the local chapter of the Tennessee Ornithological Society in Knoxville, Tennessee. This group could be active partners in BISO's bird conservation program (<http://www.tnbirds.org/KTOS.html>)
- evaluate local or regional land use data and plan potential for habitat protection across organizational boundaries
- develop land use agreements with local landowners through state, FWS programs, and especially with Catoosa Wildlife Management Area to protect important habitats and landscapes.

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. BISO is encouraged to enter all high priority projects into the NPS Performance Management Information System (PMIS) database. Funding for conservation projects for neotropical migrants is also available through the Park Flight program.

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. There are currently 14 Joint Ventures (11 US, 3 Canada). 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. BISO 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 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 2000, appropriation was approximately \$3.75 million and a majority of this funding was directed toward projects in Central and South America.

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

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

Funding opportunities for migratory bird conservation are available yet most natural resource agencies are not fully aware of and/or understanding of how to use these sources. Perhaps a

consolidated migratory bird funding source catalog will become available to managers in the future; this is needed.

Contacts: Regional contacts can be obtained at <http://southeast.fws.gov/birds/npsbirds.htm>. Additional contacts include:

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APPENDIX A

HIGH PRIORITY SPECIES IN THE NORTHERN CUMBERLAND PLATEAU PHYSIOGRAPHIC AREA (from Anderson et al. 2000)

Table 2. Priority bird species listed by total PIF concern score, and segregated by entry criteria. Other measures include area of importance and population trends scores, percent of BBS population, and local migratory status. This table includes non-breeding landbirds only in highest overall priority entry criteria.

Priority Entry Criteria & species	Total PIF score	Concern scores		Percent BBS	Local migratory status ¹
		AI	PT		
Ia. Highest overall priority					
Bewick's Wren	35	5	5	12.1	B
Red-cockaded Woodpecker	31	3	5	-	RP
Cerulean Warbler	30	5	5	25.3	B
Golden-winged Warbler	29	5	4	5.1	B
Swainson's Warbler	28	5	2	7.6	B
Ib. High overall priority					
Louisiana Waterthrush	26	5	5	10.4	B
Worm-eating Warbler	25	5	2	8.7	B
Henslow's Sparrow	26	3	3	-	E
Acadian Flycatcher	25	5	5	9.6	B
Wood Thrush	25	5	5	6.9	B
Prairie Warbler	25	5	5	5.7	B
Kentucky Warbler	24	5	3	11.9	B
Bachman's Sparrow	25	2	3	-	B
Yellow-throated Vireo	22	5	5	9.2	B
Summer Tanager	22	5	5	-	B
Eastern Wood-Pewee	22	5	5	-	B
Black-throated Blue Warbler	22	2	3	-	B
Hooded Warbler	22	5	2	8.8	B
IIa. Physiographic area priority species					
Red-headed Woodpecker	21	3	5	-	D
Yellow-breasted Chat	21	5	5	4.7	B
Field Sparrow	21	4	5	-	D
Northern Bobwhite	20	3	5	-	R
Gray Catbird	20	5	5	-	B
Black-and-white Warbler	20	5	3	-	B
Ruby-throated Hummingbird	19	4	5	-	B
American Redstart	19	4	5	-	B
Eastern Towhee	19	4	5	-	D

IIb Additional species: responsibility for monitoring (>10% BBS)

Yellow-throated Warbler	21	5	2	18.1	B
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III. Additional species: global priority

Prothonotary Warbler	21	2	3	-	B
Chuck-will's-widow	19	2	3	-	D

IV. Federal listed species

None additional to the above.

V. Local, state, or regional interest species

Common Raven	(no score, reintroduction bird)				
Whip-poor-will	20	3	6	-	B
Chestnut-sided Warbler	20	3	3	-	B
Blackburnian Warbler	19	2	3	-	B
Grasshopper Sparrow	17	2	3	-	B
Northern Harrier	(awaiting score)				

1 – Local status refers to migratory status and is adapted from Texas Partners in Flight. In this category, B refers to birds that breed in the area and winter exclusively in the tropics, D refers to birds that breed and winter in the area but may involve different populations, E refers to species which are reaching distributional limits in the area, and R refers to resident, non-migratory birds.

APPENDIX B

NORTHERN CUMBERLAND PLATEAU BIRD ASSEMBLAGES AND HABITAT CONSERVATION PRIORITIES

Table 3. Bird species assemblages designated for broad habitat type within the physiographic area, and listed by total Partners in Flight score. The sum of Area Importance, Population Trend, and Threats to Breeding are included as the Habitat Score, and provides as an indication of the importance of the habitat in the area. The overall score indicates management criteria, see below. Habitat suitability is derived from Hamel (1992).

Habitat	Species	Total PIF score	Habitat score	Overall score ¹
Open lands				
Grasslands	Henslow's Sparrow	26	11	I
	Field Sparrow	21	10	IV
	Northern Bobwhite	20	9	III
	Grasshopper Sparrow	17	8	III
	Northern Harrier	-	-	V
Shrub-scrub, reclaimed mines				
	Bewick's Wren	35	15	I, V
	Golden-winged Warbler	29	13	I, V
	Prairie Warbler	25	10	IV
	Yellow-breasted Chat	21	10	IV
	Field Sparrow	21	10	IV
	Northern Bobwhite	20	9	III
	Gray Catbird	20	9	III
	Eastern Towhee	19	9	III
	Chestnut-sided Warbler	20	8	IV
Hardwoods, mixed hardwood-pine, mixed hardwood-pine				
Northern				
Hardwoods	Worm-eating Warbler	25	12	III
	Wood Thrush	25	12	III
	Kentucky Warbler	24	11	III
	Yellow-throated Vireo	22	11	IV
	Summer Tanager	22	10	VI
	Eastern Wood-Pewee	22	11	VI
	Black-throated Blue Warbler	22	7	IV
	Hooded Warbler	22	11	IV
	Black-and-White Warbler	20	10	V
	Ruby-throated Hummingbird	19	9	IV
	Whip-poor-will	20	9	V
	American Redstart	19	8	V
	Appalachian Oak			
Mixed				
hardwood-pine	Louisiana Waterthrush	26	12	III
	Worm-eating Warbler	25	12	III
	Acadian Flycatcher	25	11	III
	Wood Thrush	25	12	III
	Kentucky Warbler	24	11	III
	Yellow-throated Vireo	22	11	IV

	Summer Tanager	22	10	IV
	Eastern Wood-Pewee	22	11	IV
	Hooded Warbler	22	11	V
	Red-headed Woodpecker	21	8	VI
	Chuck-will's-widow	19	8	V
	Whip-poor-will	20	9	V
	American Redstart	19	8	V
	Blackburnian warbler	19	8	VI
	Common Raven	-	-	V
Riparian				
Woodlands	Swainson's Warbler	28	13	I, V
	Louisiana Waterthrush	26	12	III
	Acadian Flycatcher	25	11	III
	Wood Thrush	25	12	III
	Kentucky Warbler	24	11	IV
	Summer Tanager	22	10	VI
	Eastern Wood-Pewee	22	11	VI
	Hooded Warbler	22	11	IV
	Yellow-throated Warbler	21	10	IV
	Prothonotary Warbler	21	8	VI
	Ruby-throated Hummingbird	19	9	VI
	American Redstart	19	9	III, V
	Eastern Towhee	19	9	III, V
Coniferous forests				
Hemlock-				
White Pine	Cerulean Warbler	30	13	I
	Worm-eating Warbler	25	12	II
	Acadian Flycatcher	25	11	II
	Wood Thrush	25	12	III
	Kentucky Warbler	24	11	III
	Eastern Wood-Pewee	22	11	IV
	Black-throated Blue Warbler	22	10	IV
	Hooded Warbler	22	11	IV
	Yellow-throated Warbler	21	10	III
	Blue-headed Vireo	17	9	IV
Mountain				
Yellow Pine	Red-cockaded Woodpecker	31	13	II
	Bachman's Sparrow	25	10	II
	Yellow-throated Vireo	22	11	IV
	Eastern Wood-Pewee	22	11	IV
	Yellow-throated Warbler	21	10	IV
	Red-headed Woodpecker	21	8	III
	Eastern Towhee	19	9	III
	Blue-headed Vireo	17	9	IV
Short-rotation				
Pine	Bewick's Wren	35	15	I, V
	Golden-winged Warbler	29	13	I, V
	Prairie Warbler	25	10	IV
	Bachman's Sparrow	25	10	I, V
	Eastern Wood-Pewee	22	11	VI
	Yellow-breasted Chat	21	10	VI
	Field Sparrow	21	10	VI
	Yellow-throated Warbler	21	10	VI

Red-headed Woodpecker	21	8	VI
Northern Bobwhite	20	9	II
Gray Catbird	20	9	II
Eastern Towhee	19	9	III

I – Overall scores refer to the following:

I – Crisis recovery necessary

II – Immediate management and/or policy action necessary range-wide

III – Active management to reverse, stabilize, or increase populations are needed

IV – Long-term planning and habitat responsibility are needed, immediate action may not be necessary

V – Investigations and research are necessary to further clarify population status or level of threat to the species or population

VI – Monitor population trends, develop habitat management only as needed.

APPENDIX C

Tennessee Natural Heritage Program Rare Vertebrates List January 2001

Watch-Listed in Tennessee

Scientific Name	Common Name	Physiographic Province	Federal Status	State Status	State Rank	Global Rank	State Endemic?
BIRDS							
AMMODRAMUS LECONTEII	LE CONTE'S SPARROW				S1N	G4	
CALIDRIS ALPINA	DUNLIN				S3N	G5	
CAMPEPHILUS PRINCIPALIS	IVORY-BILLED WOODPECKER		LE		SX	G4	
CIRCUS CYANEUS	NORTHERN HARRIER			D	S4N	G5	
CISTOTHORUS PLATENSIS	SHORT-BILLED MARSH WREN				S3NSPB	G5	
DENDROICA PINUS	PINE WARBLER				S5	G5	
DOLICHONYX ORYZIVORUS	BOBOLINK				SHBS4 N	G5	
ELANOIDES FORFICATUS	SWALLOW-TAILED KITE				SAN	G5	
LIMNODROMUS SCOLOPACEUS	LONG-BILLED DOWITCHER				S2N	G5	
MYCTERIA AMERICANA	WOOD STORK		(PS:LE)		S3N	G4	
PELECANUS	WHITE PELICAN				S3N	G3	
ERYTHRORHYNCHOS PICOIDES BOREALIS	RED-COCKADED WOODPECKER	CU CM BR WU CP	LE		SX	G3	
SCOLOPAX MINOR	AMERICAN WOODCOCK				S4B	G5	
VERMIVORA BACHMANII	BACHMAN'S WARBLER		LE		SX	G4	
VERMIVORA PINUS	BLUE-WINGED WARBLER				S4	G5	

Tracked in Tennessee

Scientific Name	Common Name	Physiographic Province	Federal Status	State Status	State Rank	Global Rank	State Endemic?
BIRDS							
ACCIPITER GENTILIS	GOSHAWK				SPB52N	G5	
ACCIPITER STRIATUS	SHARP-SHINNED HAWK	CU CM WR BR RV ER CP	(PS)	D	S3B	G5	
ACTITIS MACULARIA	SPOTTED SANDPIPER	CB			S2B	G5	
AEGOLIUS ACADICUS	NORTHERN SAW-WHET OWL	RV BR	MC	T	S1	G5	
AIMOPHILA AESTIVALIS	BACHMAN'S SPARROW	WR CU WU ER RV CP CB WF	MC	E	S2	G3	
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW	ER WR	MC	D	S1B	G4	
ANAS DISCORS	BLUE-WINGED TEAL				S2B	G5	
ANHINGA ANHINGA	ANHINGA	MF WR WU		D	S1B	G5	
AQUILA CHRYSAETOS	GOLDEN EAGLE	WR CB CU BR		T	S1	G5	
ARDEA ALBA	GREAT EGRET	WR MF RV BR CP		D	S2BS3N	G5	
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	ER WR			S1	G4	
BUBULCUS IBIS	CATTLE EGRET				S2BS3N	G5	

Scientific Name	Common Name	Physiographic Province	Federal Status	State Status	State Rank	Global Rank	State Endemic?
BUTEO LINEATUS	RED-SHOULDERED HAWK	MF CP WR WU RV CU ER CB			S4B	G5	
CAPRIMULGUS CAROLINENSIS	CHUCK-WILL' S WIDOW				S3S4	G5	
CAPRIMULGUS VOCIFERUS	WHIP-POOR-WILL				S3S4	G5	
CERTHIA AMERICANA	BROWN CREEPER				S2B54N	G5	
CHONDESTES GRAMMACUS	LARK SPARROW	CP WR WU CB MF		T	S1B	G5	
COCCYZUS	BLACK-BILLED CUCKOO				S2B	G5	
ERYTHROPTALMUS							
CONTOPUS COOPERI	OLIVE-SIDED FLYCATCHER	BR		D	S1	G5	
CORVUS CORAX	COMMON RAVEN	BR RV		T	S2	G5	
CORVUS OSSIFRAGUS	FISH CROW	MF			S3	G5	
DENDROICA CERULEA	CERULEAN WARBLER	RV BR WR WU CM		D	S3B	G4	
DENDROICA FUSCA	BLACKBURNIAN WARBLER				S3B54N	G5	
DENDROICA MAGNOLIA	MAGNOLIA WARBLER				S1B54N	G5	
EGRETTA CAERULEA	LITTLE BLUE HERON	CP WR MF WU		D	S2B53N	G5	
EGRETTA THULA	SNOWY EGRET			D	S2B53N	G5	
EGRETTA TRICOLOR	LOUISIANA HERON				SPB	G5	
EMPIDONAX ALNORUM	ALDER FLYCATCHER	BR			S1	G5	
EMPIDONAX MINIMUS	LEAST FLYCATCHER				S3	G5	
EMPIDONAX TRAILLII	WILLOW FLYCATCHER		(PS)		S2S3	G5	
EREMOPHILA ALPESTRIS	HORNED LARK				S4	G5	
FALCO PEREGRINUS	PEREGRINE FALCON	BR CU RV CB MF		E	S1N	G4	
FULICA AMERICANA	AMERICAN COOT				S2B	G5	
GALLINULA CHLOROPUS	COMMON MOORHEN	RV MF	(PS)	D	S1B	G5	
HALIAEETUS	BALD EAGLE	WR MF CP ER RV CB WU CU	T	D	S3	G4	
LEUCOCEPHALUS							
ICTINIA MISSISSIPPIENSIS	MISSISSIPPI KITE	MF CP		D	S2S3	G5	
IXOBRYCHUS EXILIS	LEAST BITTERN	RV MF ER CP CU CB		D	S2B	G5	
LANIUS LUDOVICIANUS	LOGGERHEAD SHRIKE		MC	D	S3	G5	
LATERALLUS JAMAICENSIS	BLACK RAIL	RV			S1	G4	
LIMNOTHLYPIS SWAINSONIISWAINSON'S WARBLER		CP BR WR MF RV CU CM WU	MC	D	S3	G4	
LOXIA CURVIROSTRA	RED CROSSBILL				S1B52N	G5	
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	RV CP MF CB			S3	G5	
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	CB RV MF CP			S2S3B	G5	
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW	RV WR			S1B54N	G5	
PASSERINA CIRIS	PAINTED BUNTING				S2	G5	
PODILYMBUS PODICEPS	PIED-BILLED GREBE	WR			S2	G5	
POECILE ATRICAPILLUS	BLACK-CAPPED CHICKADEE		MC	D	S2B	G5	
POECETES GRAMINEUS	VESPER SPARROW	BR WR		D	S1B54N	G5	
PORPHYRULA MARTINICA	PURPLE GALLINULE	ER MF			S1B	G5	
RALLUS ELEGANS	KING RAIL	ER RV WR		D	S2	G4G5	
RALLUS LIMICOLA	VIRGINIA RAIL	RV			S1B53N	G5	
REGULUS SATRAPA	GOLDEN-CROWNED KINGLET	BR			S3B54N	G5	
RIPARIA RIPARIA	BANK SWALLOW	MF RV CB			S3	G5	
SITTA CANADENSIS	RED-BREASTED NUTHATCH				S2B54N	G5	
SITTA PUSILLA	BROWN-HEADED NUTHATCH				S2B	G5	
SPHYRAPICUS VARIUS	YELLOW-BELLIED SAPSUCKER	BR CP	MC	D	S1B54N	G5	

Scientific Name	Common Name	Physiographic Province	Federal Status	State Status	State Rank	Global Rank	State Endemic?
STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	MF	LE	E	S2S3B	G4T2Q	
THRYOMANES BEWICKII	BEWICK'S WREN	WR CP BR CB CM CU WU ER MF	MC	E	S1	G5	
TROGLODYTES TROGLODYTES	WINTER WREN				S3B54N	G5	
TYRANNUS FORFICATUS	SCISSOR-TAILED FLYCATCHER				S1B5AN	G5	
TYTO ALBA	COMMON BARN-OWL	CP MF RV CB BR WR ER		D	S3	G5	
VERMIVORA CHRYSOPTERA	GOLDEN-WINGED WARBLER		MC	D	S3B	G4	
VIREO BELLII	BELL'S VIREO	CP	(P5)		SPB	G5	

Physiographic Provinces

Physiographic province information provides a broad concept of a species' distribution in Tennessee and can be indicative of a particular geologic development or age in Tennessee.

BR Blue Ridge

CB Central Basin

CM Cumberland Mountains

CP Coastal Plain

CU Cumberland Plateau

ER Eastern Highland Rim

MF Mississippi Floodplain

RV Ridge and Valley

SV Sequatchie Valley

WR Western Highland Rim

WU Western Uplands

Federal Status

Federally listed animals are protected by the Endangered Species Act of 1973 (as amended), and the list is maintained by the U.S. Fish and Wildlife Service. In Tennessee, listing and recovery responsibilities are divided between two USFWS offices, in Cookeville, TN, and Asheville, NC. Please visit <http://southeast.fws.gov/> for additional information about USFWS activities in Tennessee.

The USFWS simplified the assignment of various "candidate species" designations in 1997, and those changes are reflected here. Applicable federal statuses are defined as follows, based on nomenclature adopted by The Nature Conservancy and the Tennessee Wildlife Resources Agency:

LE	Listed Endangered	Taxon is threatened by extinction throughout all or a significant portion of its range
E/SA	Endangered by Similarity of Appearance	Taxon is treated as an endangered species because it may not be easily distinguished from a listed

		species
LT	Listed Threatened	Taxon is likely to become an endangered species in the foreseeable future
T/SA	Threatened by Similarity of Appearance	Taxon is treated as a threatened species because it may not be easily distinguished from a listed species
PE	Proposed Endangered	Taxon proposed for listing as endangered
PT	Proposed Threatened	Taxon proposed for listing as threatened
C	Candidate species***	Taxon for which the USFWS has sufficient information to support proposals to list the species as threatened or endangered, and for which the Service anticipates a listing proposal
MC	Management Concern	Unofficial federal status for potential future candidate species
(PS)	Partial Status (based on taxonomy)	Taxon which is listed in part of its range, but for which Tennessee subspecies are NOT included in the Federal designation
(PS:status)	Partial Status (based on political boundaries)	Taxon which is listed in part of its range, but for which Tennessee populations are NOT included in the Federal designation e.g. (PS:LE)
(status, XN)	Non-essential experimental population in portion of range	Taxon which has been introduced or re-introduced in an area from which it has been extirpated, and for which certain provisions of the Act may not apply

(Modified from Federal Register, 50 CFR Part 17.11 {31 December 1999})

*** Taxa listed as candidate species may be added to the list of Endangered and Threatened species, and as such, consideration should be given to them in environmental planning. Taxa listed as LE, LT, PE, and PT must be given consideration in environmental planning involving federal funds, lands, or permits, and should be given consideration in all non-federal activities. For further information, please contact the Tennessee Field Office of the USFWS, 446 Neal Street, Cookeville, TN 38501; (931) 528-6481.

State Status

In Tennessee, vertebrates, mollusks and crustaceans may be formally listed by the TWRA as Endangered, Threatened, or "Deemed in Need of Management" (T.C.A. 70-8-104, 70-8-105, 70-8-107). No insects or arachnids can be listed by the TWRA, but may be listed by the USFWS.

E	Endangered	Any species or subspecies of wildlife whose prospects of survival or recruitment within the state are in jeopardy or are likely to become so within the foreseeable future.
T	Threatened	Any species or subspecies of wildlife that is likely to become an endangered species within the foreseeable future.
D	"Deemed in Need of Management"	Any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. This category is analogous to "Special Concern".
PE	Proposed Endangered	Proposed as Endangered by the TWRA for consideration by the Tennessee Wildlife Resources Commission
PT	Proposed Threatened	Proposed as Threatened by the TWRA for consideration by the Tennessee Wildlife Resources Commission
PD	Proposed "Deemed"	Proposed as Deemed in Need of Management by the TWRA for consideration by the Tennessee Wildlife Resources Commission

Note: Many species presented in this list may have neither a state nor federal designation, however are considered rare by the DNH and should be evaluated during the environmental review process. Information is collected on these species in order to minimize the necessity of listing these taxa as Endangered or Threatened.

GRANK and SRANK

As a guide in setting conservation priorities, TNC developed a ranking system for estimating the abundance of plants and animals tracked by Heritage programs. The Global Rank (GRANK) is assigned by TNC Central Zoology staff based on the best range wide (global) abundance information for each taxon. A five-tier system (G1-G5) is used to describe rarity, from G1 (extremely rare) to G5 (widespread). The same system is applied by DNH to assign the State Rank (SRANK), which describes the species' abundance within our state borders.

SRANK and GRANK are based primarily upon the number of occurrences of the element (species) within the state and range wide, respectively. For obscure or under-studied species, ranks are based on the best available information, and consideration may be given to other factors influencing the rarity of each taxon.

SRANKs used in this list are defined below. GRANKs are similarly defined, except that ranking criteria apply range wide (e.g. an S1 species is "extremely rare" in the state, and a G1 species is "extremely rare" range wide).

S1	Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction.
S2	Very rare and imperiled within the state, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction.
S3	Rare and uncommon in the state, from 21-100 occurrences.
S4	Widespread, abundant, and apparently secure within the state, but with cause for long-term concern.
S5	Demonstrably widespread and secure in the state
SH	Of historical occurrence in Tennessee, e.g. formally part of the established biota, with the expectation that it may be rediscovered.
SU	Can not be ranked using available information.
SX	Believed to be extirpated from the state.
S#S#	Denotes a "range rank" because the rarity of the species is uncertain (e.g. S1S3).
S?	Unranked at this time
SE	Exotic species established in the state
SE#	Exotic numeric (e.g. European starling would be SE5)
SP	Potentially occurring in Tennessee, but not yet documented by DNH
_N	Occurs in Tennessee in a non-breeding status (several birds)
_B	Breeds in Tennessee
SA	Accidental or casual in the state (several birds)
SR	Reported from the state, but insufficient data to assign rank
SRF	Reported falsely from the state
HYB	Hybrid within its range in Tennessee
SSYN	Synonym for another species
_Q	Questionable taxonomy (GRANKS only)

_T#	Subspecific taxon rank (GRANKS only)
<p><i>Numerous bird species are ranked for breeding and non-breeding status in Tennessee, e.g. RED-BREASTED NUTHATCH (S2B54N), is more common as a wintering or migratory species than as a breeding species.</i></p>	

Note: Those species having an SRANK of S1 to S3, state endemics, and species with limited distribution in Tennessee should be given special consideration in environmental planning. For further information contact DNH at (615) 532-9695.

State Endemic

If a species is endemic to Tennessee (occurs nowhere else), it may be categorized as follows:

Y, Yes	Endemic to Tennessee
P, Probable	Probably endemic to Tennessee
B, Breeding	Endemic to the state as a breeder only



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APPENDIX D*

ENDANGERED, THREATENED, SPECIAL CONCERN,
AND HISTORICAL BIOTA OF KENTUCKY, 2000
Kentucky State Nature Preserves Commission (KSNPC)

Scientific Name	Common Name	Status	
		KSNPC	US
<i>Accipiter striatus</i>	Sharp-shinned hawk	S	
<i>Actitis macularia</i>	Spotted sandpiper	E	
<i>Aimophila aestivalis</i>	Bachman's sparrow	E	
<i>Ammodramus henslowii</i>	Henslow's sparrow	S	
<i>Anas clypeata</i>	Northern shoveler	E	
<i>Anas discors</i>	Blue-winged teal	T	
<i>Ardea alba</i>	Great egret	E	
<i>Ardea herodias</i>	Great blue heron	S	
<i>Asio flammeus</i>	Short-eared owl	E	
<i>Asio otus</i>	Long-eared owl	E	
<i>Bartramia longicauda</i>	Upland sandpiper	H	
<i>Botaurus lentiginosus</i>	American bittern	H	
<i>Bubulcus ibis</i>	Cattle egret	S	
<i>Certhia americana</i>	Brown creeper	E	
<i>Chondestes grammacus</i>	Lark sparrow	T	
<i>Circus cyaneus</i>	Northern harrier	T	
<i>Cistothorus platensis</i>	Sedge wren	S	
<i>Corvus corax</i>	Common raven	E	
<i>Corvus ossifragus</i>	Fish crow	S	
<i>Dendroica fusca</i>	Blackburnian warbler	T	
<i>Dolichonyx oryzivorus</i>	Bobolink	S	
<i>Egretta caerulea</i>	Little blue heron	E	
<i>Empidonax minimus</i>	Least flycatcher	E	
<i>Falco peregrinus</i>	Peregrine falcon	E	
<i>Fulica americana</i>	American coot	H	
<i>Gallinula chloropus</i>	Common moorhen	T	
<i>Haliaeetus leucocephalus</i>	Bald eagle	E	T

Scientific Name	Common Name	Status	
		KSNPC	US
<i>Ictinia mississippiensis</i>	Mississippi kite	S	
<i>Ixobrychus exilis</i>	Least bittern	T	
<i>Junco hyemalis</i>	Dark-eyed junco	S	
<i>Lophodytes cucullatus</i>	Hooded merganser	T	
<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	T	
<i>Nycticorax nycticorax</i>	Black-crowned night-heron	T	
<i>Pandion haliaetus</i>	Osprey	T	
<i>Passerculus sandwichensis</i>	Savannah sparrow	S	
<i>Phalacrocorax auritus</i>	Double-crested cormorant	H	
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	S	
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	E
<i>Podilymbus podiceps</i>	Pied-billed grebe	E	
<i>Pooecetes gramineus</i>	Vesper sparrow	E	
<i>Rallus elegans</i>	King rail	E	
<i>Riparia riparia</i>	Bank swallow	S	
<i>Sitta canadensis</i>	Red-breasted nuthatch	E	
<i>Sterna antillarum</i>	Least tern	E	E
<i>Thryomanes bewickii</i>	Bewick's wren	S	
<i>Tyto alba</i>	Barn owl	S	
<i>Vermivora chrysoptera</i>	Golden-winged warbler	T	
<i>Vireo bellii</i>	Bell's vireo	S	
<i>Wilsonia canadensis</i>	Canada warbler	S	

E: Endangered. A taxon in danger of extirpation and/or extinction throughout all or a significant part of its range in Kentucky.

T: Threatened. A taxon likely to become endangered within the foreseeable future throughout all or a significant part of its range in Kentucky.

S: Special Concern. A taxon that should be monitored because (1) it exists in a limited geographic area in Kentucky, (2) it may become threatened or endangered due to modification or destruction of habitat, (3) certain characteristics or requirements make it especially vulnerable to specific pressures, (4) experienced researchers have identified other factors that may jeopardize it, or (5) it is thought to be rare or declining in Kentucky but insufficient information exists for assignment to the threatened or endangered status categories.

H: Historic. A taxon documented from Kentucky but not observed reliably since 1980 but is not considered extinct or extirpated.

APPENDIX E

USFWS Species of Conservation Concern 2002 Appalachian Mountains BCR 28

Peregrine Falcon
Upland Sandpiper
Buff-breasted Sandpiper
Black-billed Cuckoo
Short-eared Owl
Northern Saw-whet Owl (breeding populations only)
Chuck-will's-widow
Whip-poor-will
Red-headed Woodpecker
Yellow-bellied Sapsucker (breeding populations only)
Olive-sided Flycatcher
Acadian Flycatcher
Black-capped Chickadee (southern Blue Ridge populations only)
Bewick's Wren
Sedge Wren
Wood Thrush
Golden-winged Warbler
Prairie Warbler
Cerulean Warbler
Prothonotary Warbler
Worm-eating Warbler
Swainson's Warbler
Louisiana Waterthrush
Kentucky Warbler
Bachman's Sparrow
Henslow's Sparrow
Red Crossbill (southern Appalachian populations only)