

**FINAL DRAFT**

# Avian Conservation Implementation Plan Buck Island Reef National Monument

National Park Service  
Southeast Region



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

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

## TABLE OF CONTENTS

Introduction.....	3
Background .....	3
The North American Bird Conservation Initiative .....	4
The Southeastern Bird Conservation Initiative: National Park Service .....	5
Role of NPS in Avian Conservation.....	5
Park Description .....	7
Avian Resources of Puerto Rico and the US Virgin Islands.....	8
Avian Conservation in BUIS .....	10
Park Identified Needs for Avian Conservation.....	11
Coordination with Regional Conservation Initiatives .....	11
North American Bird Conservation Initiative .....	11
North American Waterfowl Management Plan.....	13
Partners In Flight .....	13
United States Shorebird Conservation Plan .....	13
Waterbird Conservation for the Americas.....	13
Integration of NABCI Goals and Objectives into Park Planning and Operations: NABCI Implementation	
Recommendations .....	13
Inventory .....	14
Monitoring .....	15
Habitat Restoration .....	16
Threat Management.....	17
Research .....	18
Compliance .....	18
Outreach .....	18
Partners and Partnerships .....	19
Funding Opportunities .....	20
Contacts.....	22
Literature Cited.....	24
Appendixes	
PUERTO RICO AND VIRGIN ISLANDS Watch List	
Bird-Habitat Relationships for Puerto Rico and Virgin Islands, West Indies	
US Fish and Wildlife Service Species of Conservation Concern (2002) for the Caribbean – Puerto Rico and the U.S. Virgin Islands (BCR 69)	

## Introduction

This Avian Conservation Implementation Plan (ACIP) is provided to the staff at Buck Island Reef National Monument (BUIS) to help identify and prioritize bird conservation opportunities, and to provide information and guidance for the successful implementation of needed conservation activities. This plan may identify goals, strategies, partnerships, and perhaps specific projects for the park to participate in existing bird conservation planning and implementation efforts associated with the North American Bird Conservation Initiative (NABCI). Under the auspice of NABCI, appropriate bird and habitat conservation goals may be recommended as identified in the appropriate existing national or regional bird conservation efforts aligned with this initiative: Partners In Flight (PIF), North American Waterfowl Management Plan (NAWMP), US Shorebird Conservation Plan (USSCP), and Waterbird Conservation for the Americas (WCA). For example, parks in the Appalachians and the Cumberland Plateau will have few if any high priority waterbird conservation issues at a regional landscape or greater scale. As such, little information regarding waterbird conservation will be presented in the ACIP, unless there is an identified park need for this species group, or other mandates, such as federal laws. Similarly, because BUIS has both coastal and upland avifauna, recommendations will be provided in the ACIP based on the PIF plan, as well as national shorebird and colonial waterbird plans. However, all high priority bird conservation issues for BUIS will be discussed and integrated as appropriate.

Information and data presented in the ACIP have been obtained from several sources: 1) interviews with BUIS staff, 2) BUIS bird conservation partners, 3) the PIF Puerto Rico and US Virgin Islands Bird Conservation Plan (Nunez-Garcia and Hunter 2000), 4) NPS databases, 5) peer reviewed bird conservation and management literature, and 6) personal communications with bird conservation specialists throughout North America and the Caribbean. This plan has been reviewed by BUIS resource management staff and managers, South Florida/Caribbean Inventory and Monitoring Network (SF/C) staff, and bird conservation partners and approved by BUIS management. Optimally, this plan will be incorporated into the park's management documents and updated annually to reflect completed projects, newly identified needs, and shifts in bird conservation priorities in the region.

**BUIS is not obligated to undertake any of the proposed actions in this plan. The plan is provided to offer guidance to BUIS to voluntarily support important park, regional, and perhaps national and international bird conservation projects for which BUIS 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)* arose out of this realization. The vision of NABCI (<http://www.nabci-us.org/main2.html>) 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 BUIS and with adjacent partners or landowners. Concurrently, the development of a Memorandum of Understanding (MOU) between the FWS and the NPS to implement Presidential Executive Order (EO) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (US Government 2000), calls for integration of programs and recommendations of existing bird conservation efforts into park planning and operations. Complementing each other, the MOU and the Southeastern Bird Conservation Initiative will advance bird conservation in the Southeast Region of the NPS beyond current regional NPS efforts.

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

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

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

The NPS is the fourth largest landowner in the United States, consisting of over 380 national park units covering 83 million acres of land and water with associated biotic resources ([www.nps.gov](http://www.nps.gov)). The 64 units in the Southeast Region of the NPS represent 16% of the total number of park units in the national park system and cover approximately 5% of the total land base in the entire system. Park units in the Southeast Region include national seashores (Canaveral National Seashore, Cape Hatteras National Seashore), national parks (Great Smoky Mountains National Park, Buck Island Reef National Monument), 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 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**

President John F. Kennedy established Buck Island Reef National Monument in 1961. The monument was created to preserve one of the Caribbean's finest marine gardens for scientific and educational interest, and for recreational uses. Buck Island is located 2.4 km (1.5 miles) northeast of St. Croix, the largest of the U.S. Virgin Islands. The monument totals 356 ha (880 acres), 71 ha (176 acres) are uninhabited subtropical dry forest island and 285 ha (704 acres) are submerged lands. The park's significance lies primarily in the extensive elkhorn coral barrier reefs surrounding the eastern two thirds of the island. Recent research has identified the Buck Island coral reef ecosystem as

critical developmental habitat for the endangered hawksbill sea turtle. The island provides nesting habitat for two endangered species – hawksbill and leatherback turtle– and two threatened species – the green turtle and least tern, as well as several rare native plant species, and one endemic beetle.

## **Avian Resources of Puerto Rico and the US Virgin Islands**

Puerto Rico and the Virgin Islands are part of the West Indies, a chain of islands that extends from Florida to Venezuela and separate the Caribbean Sea from the Atlantic Ocean (see PIF and NPS maps below). These tropical Islands are located within 17-19° latitude North and 64-68° longitude West about 1,609 kilometers from Florida and 805 kilometers from Venezuela.

The U.S. Virgin Islands are located about 64 kilometers east of the Puerto Rico. These Islands comprise another archipelago that includes St. Thomas, St. John, St. Croix, and numerous uninhabited small islets and cays. The three main Islands were bought by the U.S.A. from Denmark in 1917 and are now U.S. Territory with a total area of 340 km<sup>2</sup>.

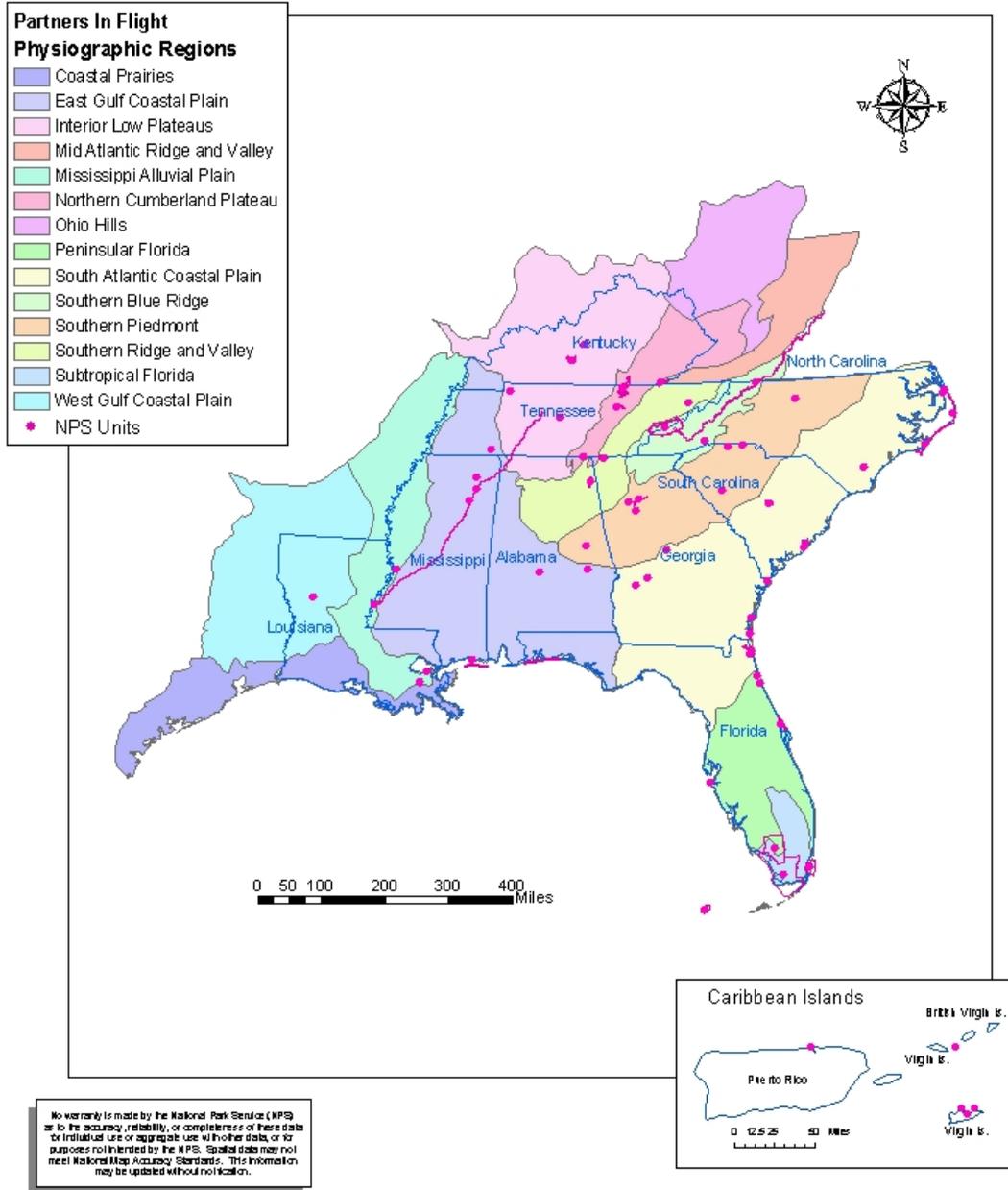
The number, size and shape of the islands comprised within this region combined with climate, topography, geological processes, and human activities have produced a tremendous diversity of habitats. Historically different types of forest covered most of the land area of Puerto Rico and the Virgin Islands. However, forest conversion caused by agricultural and other land use practices have shaped the present landscape. Forested landscape in the U.S. Virgin Islands is typified by sub-tropical dry forest and littoral shrubs.

The total number of bird species in the region (Including vagrants, exotics, and fossils) sums to 364. Presently, 276 species are known to occur in Puerto Rico and 210 in the Virgin Islands for a total of 284 species in the region (Raffaele 1989). Recent studies indicate that these numbers may change as many native forms may be reclassified as species or subspecies on their own. Raffaele (1989) categorized the regional birds species as follows: 97 breeding permanent residents (94 in Puerto Rico and 60 in the Virgin Islands), 11 breed and leave (11 in Puerto Rico and 10 in the Virgin Islands), 134 non-breeding migrants and visitors (134 Puerto Rico and 129 the Virgin Islands), 31 introduced probable breeders (31 in Puerto Rico and 6 in the Virgin Islands), five introduced possible breeders (same species for both Puerto Rico and the Virgin Islands), and one species recently extirpated from Puerto Rico. As the numbers indicate, migrant species comprise almost half of the species playing a major role in the ecology of the region. Also noteworthy is the establishment of a high number of exotic species. As a result of combining both native and exotic species, Puerto Rico supports 85 species of breeding land birds, the greatest number of any West Indian island and except for Cuba, harbors the second largest total number of species in the region (Raffaele 1989).

# Partners in Flight (PIF) Regions

Southeast Region (SER)

National Park Service  
U.S. Department of the Interior



The oceanic nature of the islands in the region has resulted in increased endemism. Puerto Rico harbors 16 endemic bird species including one endemic genus (*Nesospingus*) represented by a single species, the Puerto Rican Tanager and one family (Todidae) shared with the rest of the West Indian islands but found nowhere else. Rafaele (1989) considered 51 species to be threatened in the region mostly because of the detrimental effects of habitat alteration.

## Avian Conservation in BUIS

**Avian Biodiversity:** BUIS has an avian presence inventory that is considered at least 90% complete. No public checklist is available at this time. Verified records of birds in BUIS 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.

**Threatened and Endangered Species:** One Federally listed endangered species, the Brown Pelican, nests in the park. The recently delisted American Peregrine Falcon occurs as a rare winter visitor to the park and vicinity.

Several USVI Territory Listed species occur in BUIS including Brown Pelican, White-crowned Pigeon, White-cheeked Pintail, Wilson's Plover, and Least Tern.

Several high priority PIF species for the Caribbean occur in BUIS (see Appendix A and B). Prominent among these species are White-crowned Pigeon, Yellow Warbler, White-cheeked Pintail, and Brown Pelican. It is likely that several Neotropical migrants, especially wood warblers, utilize the subtropical dry forests of the park of Buck Island. Though many of these species are not listed, they are of high conservation concern in the continental U.S. and conservation efforts for this species extend to the USVI. Conservation of these species should be coordinated with the US Virgin Island Department of Planning and Natural Resources (VIDPNR) (see contacts).

**Park Priorities:** Park staff and consultants have identified the Brown Pelican and Least Tern as a park management concern or high priority for conservation. Additionally, since the successful eradication of tree rats on the island, the staff has an interest in obtaining information on landbirds and how their populations respond to eradication of the rats. BUIS is certain to have some species that are high priority in the USVI and conservation efforts in the park could focus on these species or groups of species.

**Inventory:** Bird inventory data provide important information for park management, particularly when inventories are conducted within the framework of the NPS I&M Program. BUIS is one of seven parks in the South Florida/Caribbean I&M Network for which a plan to conduct high priority inventory projects has been prepared (Sasso and Patterson 2000). ). Although VIIS avian inventory is considered complete in relation to

the NPS's I&M goals (90% or greater species known), additional inventory is desired to determine breeding bird distribution and abundance in the upland portions of the park.

**Monitoring:** The park is encouraged to 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/mhcp/groups.htm>.

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

- Brown Pelican reproductive survey that includes counts of adults, nests, and fledglings
- Least Tern nest and egg counts
- Christmas Bird Count (CBC) that covers Buck Island

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

**Outreach:** The park conducts outreach and education regarding beach closures for nesting Least Terns on Buck Island.

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

BUIS desires to:

- identify and quantify all resident and migratory bird species that nest or ground forage
- obtain population trend data for nesting and ground foraging species

## **Coordination with Regional Conservation Initiatives**

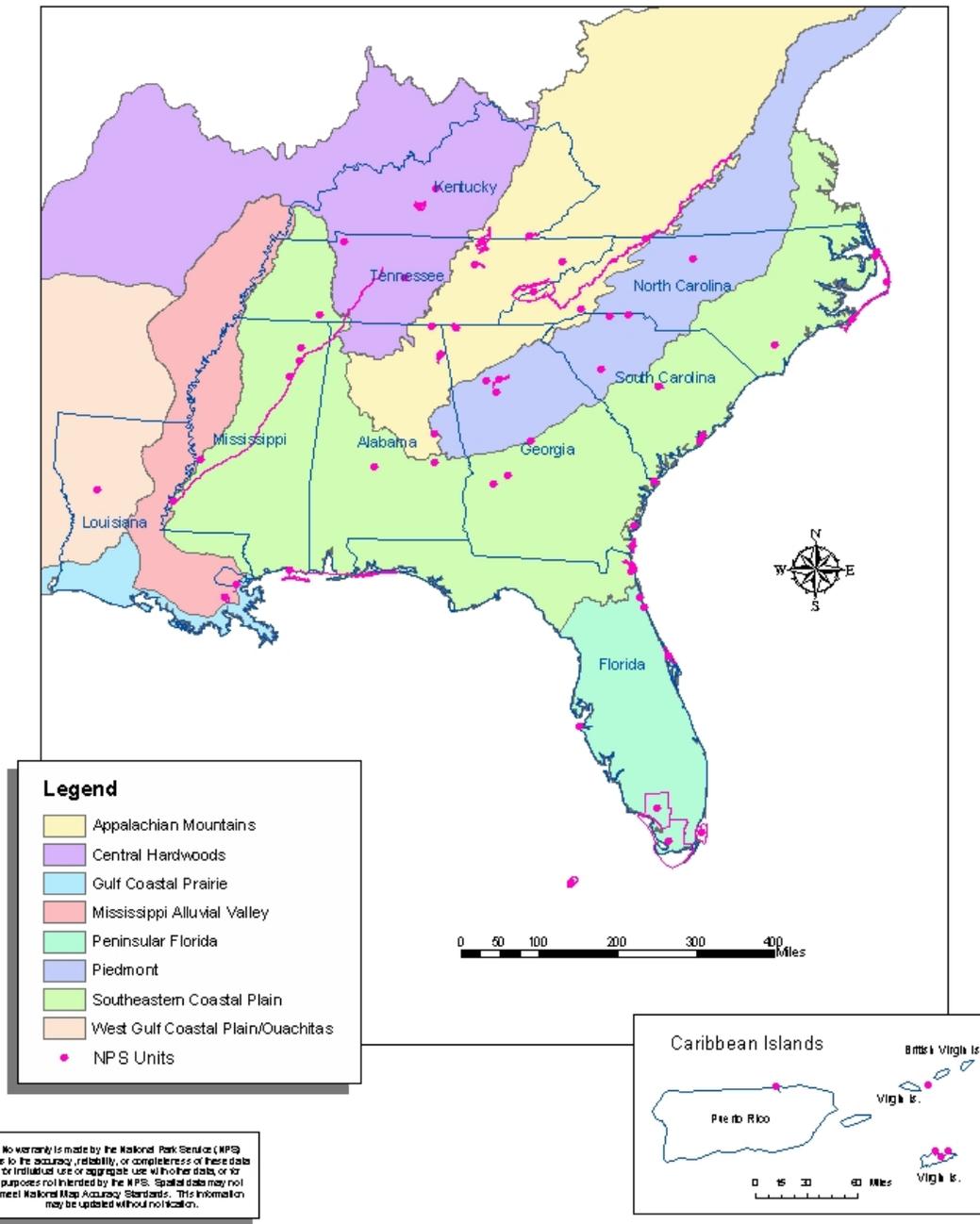
**North American Bird Conservation Initiative:** NABCI bird conservation planning units, referred to as Bird Conservation Regions (BCR), are often larger than other planning units associated with other plans, such as Partners In Flight. For example, BUIS is within the NABCI BCR 69 that includes all of the Commonwealth of Puerto Rico, the US Virgin Islands and the British Virgin Islands and includes the physiographic region designated by Partners in Flight as Puerto Rico/Virgin Islands (see BCR map below; compare to PIF and NPS 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 Caribbean BCR does not have a designated coordinator; however, the

# Bird Conservation Regions

Southeast Region (SER)

National Park Service  
U.S. Department of the Interior



assistant coordinator for the Atlantic Coast Joint Venture (ACJV) can provide valuable assistance to BUIS 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 Caribbean 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.

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 USVI does not have a PIF coordinator, but several VIDPNR personnel are currently engaged in bird conservation in the USVI and will be instrumental with implementation of this ACIP and projects important to bird conservation relative to Buck Island's role in implementation of the Puerto Rico and US Virgin Islands bird conservation 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 BUIS 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/>).

## **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 BUIS 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, especially for ground nesting and foraging birds. Additionally, information on use of Buck Island by Neotropical migrant birds wintering in the park is desired. Status of high priority species as identified in the Puerto Rico/US Virgin Islands bird conservation plan is needed to effectively structure park management for the continued preservation and enhancement of the park's avifauna.

**Abundance and distribution data are needed:**

- **for all resident and migratory landbirds that nest and forage on or near the ground\***
- **for birds that nest in mangroves\***
- **for High Priority forest species such as White-crowned Pigeon\***
- **for nesting, migrating, and wintering shorebirds, particularly American Oystercatcher and Wilson's Plover.**

Additionally, the park is encouraged to:

- **partner with the VIDPNR and USFWS to coordinate area inventory efforts**
- **verify other avian observational data collected in the park and enter into the appropriate database (NPSpecies, eBird Monitoring Program of Cornell's Laboratory of Ornithology, Columbid Database, etc.)**
- **standardize inventory and monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000).**

**Monitoring:** The park has an active bird monitoring program, and has documented that many high priority species occur in the park. Efforts should be made to continue existing monitoring programs, striving to conform to established NPS or FWS surveys protocols. The park is encouraged to 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/mbcg/groups.htm>. Close coordination with adjacent bird conservation initiatives 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, eBird, or National Point Count Database (USGS 2001) (<http://www.mp2-pwrc.usgs.gov/point/>))**
- **establish point count monitoring stations along ecologically distinct or vegetative/habitat types to document abundance and distribution of terrestrial landbirds year around in response to eradication of rats**

- **establish monitoring programs based on results of inventory data for High Priority species and with potential for high conservation role for any of these species**
- **standardize inventory and monitoring methodology to conform to NPS and/or FWS recommended standards (Fancy and Sauer 2000, Hunter 2000).**
- **partner with USVI territorial Department of Natural Resources and USFWS staff to coordinate area monitoring efforts**

**Habitat Restoration/Management:** 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 BUIS 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 BUIS can greatly contribute to established habitat goals identified in the Puerto Rico/US Virgin Islands bird conservation plan.

Research suggests that the large contiguous moist forests of St. John provide significant habitat for wintering Neotropical migrants (Askins et al. 1989). Though the forests of Buck Island are much smaller, efforts should be made to determine the importance of this habitat to wintering Neotropical migrants.

Specific recommendations are to:

- restore and/or improve hydrological quality and processes where needed, especially in coastal mangrove and salt ponds
- assess Pre-Columbian landscape cover and determine feasibility of restoring landscape within the context of the park's enabling legislation

- 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

**Threat Management:** Impact of exotic species on birds at VIIS has been the greatest threat to the avifauna of BUIS. However, since the eradication of the mongoose in the 1980's and the tree rat in the early 2000's, no significant exotic mammalian threat exists on Buck Island. Current threats include human and dog intrusions on the Least Tern colony on the beach. The park is encouraged to:

- **manage visitor use, especially boat landings and dogs off lease, at the Island to protect and eliminate disturbances to the Least Tern colony\***
- **identify, monitor, and document bird mortality associated with the US Coast Guard tower, especially during migrations of Neotropical migrants\***
- **enforce the no dog policy\***
- **identify potential bird injury or mortality associated with fishing gear and fishing practices in the park and nearby waters, especially for Brown Pelican, Brown Booby, and Magnificent Frigatebird\***

Although exotic plants species may negatively impacting habitat at BUIS, the nature of this impact on native birds is unknown. It is important to

- **establish and continue inventory and monitoring of exotic plant species\***
- **identify any potential impact these species have on native avifauna\***
- **establish appropriate management programs to restore native forests\***

If necessary, consult with regional Exotic Plant Management Team (EPMT) to remove exotic plant species. Currently, no EPMT provides service the VIIS area. Until an EPMT is established that can provide assistance to VIIS, staff is directed to consult with the regional pest management specialist (see contacts).

Additionally, the park is encouraged to:

- **hire additional protection staff to better manage threats and implement projects identified in this plan\***
- **develop aggressive outreach and education program for protection of Buck Island resources**

**Research:** the park is encouraged to:

- **list park needs and projects on Research Permit and Reporting System web site (RPRS)**
- develop contact with South Florida/Caribbean Cooperative Ecosystem Studies Unit (CESU) at the University of Miami, Miami, FL

**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:** the park is encouraged to:

- **participate in International Migratory Bird Day (IMBD) events with a local partner (<http://birds.fws.gov/imbd.html>)\***
- **update the bird checklist for public availability\***
- **nominate BUIS as an Important Bird Area (<http://www.abcbirds.org/iba/nominstr.htm>)**
- **continue to develop and implement outreach and educational programs to enhance visibility of bird conservation issues**

- encourage Virgin Islands Audubon Society to participate in ongoing and new inventory and monitoring programs
- 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>))
- 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>)
- participate in bird conservation efforts of the Society for the Conservation and Study of Caribbean Birds (SCSCB), including subscribing to this organization's electronic information forum
- 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:

- **cooperate and USVI DNR in the preparation and implementation of the USVI Comprehensive Wildlife Conservation Plan**
- **work with the White-crowned Pigeon Working Group of the SCSCB to determine appropriate conservation actions for this species in the park**
- **become a contributing member of the Caribbean Columbidae Population Data Center, a cooperative effort of the Puerto Rico Department of Natural Resources, USFWS, and other Caribbean interests to assess populations status and implement conservation actions necessary for these species**
- **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 Puerto Rico and US Virgin Islands Bird conservation plan**

- **encourage the USVI territorial government to become a member of the Atlantic Coast Joint Venture, increasing USVI partners chances to utilize NAWCA funds for bird and habitat conservation projects**
- continue to maintain productive relationship with local Audubon Society
- explore the potential to utilize facilities and expertise at the Virgin Island Environmental Research Station (VIERS) to conduct needed avian research and implementation of 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. BUIS 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. 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. BUIS 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 has recently been authorized under the Neotropical Migratory Bird Conservation Act (2000) (<http://www.nfwf.org/programs/nmbcapp.htm>). Appropriations through this Act are authorized up to \$5 million per year. However, in 2000, appropriation was approximately \$3.75 million and a majority of this funding was directed toward projects in Central and South America.

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

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

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

**Contacts:** Primary contacts within the region can be obtained by viewing the web site for the Southeastern Bird Conservation Initiative, National Park Service at <http://southeast.fws.gov/birds/npsbirds.htm>. Primary contacts for BUIS are:

**Virgin Islands Department of Planning and Natural Resources**

Judy Pierce  
VI Territorial Department of Natural Resources  
St. Thomas, USVI  
[sula@vitelcom.net](mailto:sula@vitelcom.net)

Doug McNair  
VI Territorial Department of Natural Resources  
St. Thomas, VI  
[dbmcnair@vipowernet.net](mailto:dbmcnair@vipowernet.net)

**US Fish and Wildlife Service**

Keith Watson  
Asheville, NC 28801  
828-350-8228  
[Keith.Watson@fws.gov](mailto:Keith.Watson@fws.gov)

Craig Watson  
Atlantic Coast Joint Venture  
Charleston, SC  
843-727-4707 ext. 16  
[Craig.Watson@fws.gov](mailto:Craig.Watson@fws.gov)

Jennifer Wheeler  
Waterbird Conservation Plan  
Coordinator  
703-358-1714  
[Jennifer.A.Wheeler@fws.gov](mailto:Jennifer.A.Wheeler@fws.gov)

Chuck Hunter  
Regional Refuge Biologist  
Atlanta, GA  
404-679-7130  
[Chuck.Hunter@fws.gov](mailto:Chuck.Hunter@fws.gov)

**National Park Service**

Zandy Hillis-Starr  
Christiansted, USVI  
340 773-1460 x235  
[Zandy.Hillis-Starr@nps.gov](mailto:Zandy.Hillis-Starr@nps.gov)

Laurel Trager  
Virgin Islands National Park  
Division of Interpretation  
St. John, USVI  
[Laurel.Trager@nps.gov](mailto:Laurel.Trager@nps.gov)

Matt Patterson  
SF/C Network Coordinator  
National Park Service  
Homestead, FL  
[Matt.Patterson@nps.gov](mailto:Matt.Patterson@nps.gov)

Chris Furqueron  
404-562-3113 ext 540  
National Park Service  
Exotic Plant Management Coordinator  
[Chris.Furqueron@nps.gov](mailto:Chris.Furqueron@nps.gov)

Carol Daniels  
South Florida/Caribbean CESU  
Rosentiel School of Marine and  
Atmospheric Sciences  
University of Miami  
Miami, FL  
[Carol.Daniels@nps.gov](mailto:Carol.Daniels@nps.gov)

## **Others**

### **Exotic Animal Management**

Frank Boyd  
USDA APHIS Wildlife Services  
Director, USVI  
118 Extension Hall  
Auburn University, AL 36849  
334-844-5670  
[fboyd@acesag.auburn.edu](mailto:fboyd@acesag.auburn.edu)

Mr. Mark Wimer  
US Geological Survey  
Biological Research Division  
Patuxent Wildlife Research Center  
Patuxent, MD  
[Mark\\_Wimer@usgs.gov](mailto:Mark_Wimer@usgs.gov)

Mr. Will Henderson  
Virgin Islands Audubon Society  
St. John, USVI  
<http://www.audubon.org/affiliate/vi/vi/>

Mr. Bob Cook  
Virgin Islands Audubon Society  
<http://www.audubon.org/affiliate/vi/vi/>

Dr. Robert Askins  
Connecticut College  
New London, CT  
[raask@conncoll.edu](mailto:raask@conncoll.edu)

Dr. David Ewert  
The Nature Conservancy – Michigan  
East Lansing, MI  
[dewert@pilot.msu.edu](mailto:dewert@pilot.msu.edu)

The Nature Conservancy – Eastern  
Caribbean  
3052 Estate Little Princess  
Christiansted, St. Croix  
U.S.V.I. 00820  
(340) 773-5575

## LITERATURE CITED

- Askins, R.A., D.N. Ewert, and R.L. Norton. 1989. Abundance of wintering migrants in fragmented and continuous forests in the U.S. Virgin Islands. Manomet Symposium 1989. 197-206.
- 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.
- 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.
- 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.
- Nunez-Garcia, F. and Hunter, W.C. 2000. Puerto Rico and US Virgin Islands Bird Conservation Plan. Version 1. December 2000. xp.
- Raffaele, H. A. 1989. A Guide to the Bird of Puerto Rico and the Virgin Islands. Revised Edition. Princeton University Press. 254pp. illus.
- Sasso, C.R. and M. Patterson. 2000. A Study Plan to the Inventory of Vascular Plants and Vertebrates in the South Florida/Caribbean Network of the National Park Service. 83p.
- 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. 2001. National Park Service Management Policies. 2001. December 2000. 137p.

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.

## APPENDIX A

### PUERTO RICO AND VIRGIN ISLANDS (BCR 69) BASED ON CONTINENTAL AND REGIONAL WATCH LIST AMONG ALL BIRDS WITHIN SOUTHEAST U.S., AND THE WEST INDIES\*

**(Action Levels: IM=Immediate Management; MA=Management Attention; PR=Long-Term Planning and Responsibility)** (subspecies/populations of interest noted; all species breed or are resident unless otherwise indicated; ba=number of breeding adults)

#### Tier I. Continental Conservation Interest

##### a. Multiple Causes for concern across entire range

White-tailed Tropicbird	(500-600 pairs, 14-19% in West Indies)	IM
Red-billed Tropicbird	(375-450 pairs, 14-22% in West Indies)	IM
West Indian Whistling-Duck	(<100 ba, 1-5% globally)	IM
Black Rail	(Extirpated?)	IM
Snowy Plover	(Threatened Pacific Coast; West Indies subspecies)	IM
Piping Plover	(Endangered, winter)	IM
Plain Pigeon	(Endangered; <5,000 ba, <10% globally)	IM
Puerto Rican Parrot	(Endangered; <100 ba in the wild, 100% globally)	IM
Puerto Rican Nightjar	(Endangered; <2,000 ba, 100% globally)	IM
White-necked Crow	(Endangered/Extirpated from Puerto Rico)	IM
Bicknell's Thrush	(Possible rare winter in Puerto Rico)	PR
Golden-winged Warbler	(Rare winter)	PR
Elfin-Woods Warbler	(Candidate for Listing; <1,000 ba, 100% globally)	IM
Yellow-shouldered Blackbird	(Endangered; <500 ba, 100% globally)	IM

##### b. Moderately abundant or widespread with declines and/or high threats

Audubon's Shearwater	(~150 pairs, 2-4% in West Indies)	IM
Masked Booby	(300 pairs, 50% in West Indies)	IM
Red-footed Booby	(1,450-2,650 pairs, 15-33% in West Indies)	IM
Brown Booby	(2,075-2,300 pairs, 22-36% in West Indies)	MA
Little Blue Heron		MA
American Golden-Plover	(Rare southbound transient)	PR
Lesser Yellowlegs	(non-breeding)	MA
Solitary Sandpiper	(transient)	MA
Upland Sandpiper	(Rare transient)	PR
Whimbrel	(non-breeding)	MA
Sanderling	(non-breeding)	MA
Semipalmated Sandpiper	(non-breeding)	MA
Western Sandpiper	(non-breeding)	MA
Stilt Sandpiper	(non-breeding)	MA
Wilson's Snipe	(winter)	MA
Gull-billed Tern	(non-breeding?)	PR
Roseate Tern	(North Atl. Endangered, West Indies Threatened; 1,200-3,600 pairs, >25% in West Indies)	IM
Least Tern	(Calif. & interior subspecies Endangered; 300-450 pairs, 8-25% in West Indies)	IM
White-crowned Pigeon		MA
Mangrove Cuckoo		MA
Short-eared Owl	(Greater Antillean subspecies)	MA
Puerto Rican Vireo	(100 % globally)	MA
Prairie Warbler	(winter)	MA

Prothonotary Warbler	(winter)	MA
Worm-eating Warbler	(winter)	MA
Kentucky Warbler	(Rare winter)	PR
Greater Antillean Oriole	(10-20% globally)	MA

**c. Restricted distributions and/or low population size**

Magnificent Frigatebird	(700-900 pairs, 13-21% in West Indies)	IM
Reddish Egret	(Rare, non-breeding)	PR
Caribbean Coot	(1,000 ba, <50,000 West Indies)	IM
Wilson's Plover		MA
American Oystercatcher	(Eastern North American subspecies)	IM
Red Knot	(non-breeding; presumably Alaskan subspecies)	PR
Bridled Tern	(900-1,700 pairs, 15-40% in West Indies)	MA
Antillean Nighthawk		PR
Black Swift	(West Indian subspecies)	MA
Lesser Antillean Pewee	(Puerto Rican subspecies)	PR
Blue-winged Warbler	(Rare, winter)	PR
Adelaide's Warbler	(100% globally)	PR
Swainson's Warbler	(Rare, winter)	PR

**Tier II. Regional Conservation Interest**

**a. High Concern**

Brown Pelican	(West Indies, Endangered; 520-850 pairs, 25-40% in West Indies)	IM
Green Heron		MA
Yellow-crowned Night-Heron		PR
Black-bellied Plover	(non-breeding)	MA
Ruddy Turnstone	(non-breeding)	MA
Least Sandpiper	(non-breeding)	MA
Antillean Mango	(nearly extirpated on Virgin Islands)	MA
Black-whiskered Vireo		PR

**b. High Threats**

Pied-billed Grebe	(breeding populations only)	MA
Least Bittern		MA
Black-crowned Night-Heron		MA
Greater Flamingo	(Extirpated as a resident, may be recolonizing)	MA
White-cheeked Pintail	(Lesser subspecies; <5,000 ba Puerto Rico-Virgin Islands; ~60,000 ba in West Indies)	MA
Ruddy Duck	(West Indian subspecies; ~1,500 ba Puerto Rico; <<50,000 ba West Indies)	MA
Masked Duck	(West Indian populations; <100 ba Puerto Rico; <<50,000 ba West Indies)	MA
Sharp-shinned Hawk	(Puerto Rican subspecies, Endangered; <100 ba)	IM
Broad-winged Hawk	(Puerto Rican subspecies, Endangered; <100 ba)	IM
American Kestrel	(Eastern Caribbean subspecies)	MA
Clapper Rail		MA
Yellow-breasted Crake	(Hispaniolan-Puerto Rican subspecies)	MA
Purple Gallinule		MA
Limpkin	(Hispaniolan-Puerto Rican subspecies)	IM
Willet		MA

Key West Quail-Dove		MA
Bridled Quail-Dove		MA
Puerto Rican Screech-Owl	(Virgin Islands subspecies, extirpated except on Culebra?)	IM
Yellow Warbler	(West Indian "Golden" subspecies)	MA
Louisiana Waterthrush	(winter)	MA

**c. High Responsibility**

Tricolored Heron		PR
Black-necked Stilt		PR
Pectoral Sandpiper	(transient)	PR
Sooty Tern	(55,000-80,000 pairs, 20-40% in West Indies)	PR
Black Tern	(transient)	PR
Brown Noddy	(1,300-2,100 pairs, 7-18% in West Indies)	PR
Scaly-naped Pigeon		PR
Zenaida Dove		PR
Puerto Rican Lizard-Cuckoo	(100% global)	PR
Puerto Rican Screech-Owl	(Puerto Rican subspecies; 100% globally)	PR
Green Mango	(100% globally)	PR
Antillean Crested Hummingbird		PR
Puerto Rican Emerald	(100% globally)	PR
Puerto Rican Tody	(100% globally)	PR
Puerto Rican Woodpecker	(100% globally)	PR
Caribbean Elaenia		PR
Puerto Rican Flycatcher	(100% global, nearly extirpated Virgin Islands)	PR
Gray Kingbird		PR
Loggerhead Kingbird	(Puerto Rican-Vieques subspecies)	PR
Caribbean Martin		PR
Cave Swallow		PR
Red-legged Thrush	(Hispaniolan-Puerto Rican subspecies)	PR
Northern Parula	(winter)	PR
Cape May Warbler	(winter)	PR
Black-throated Blue Warbler	(winter)	PR
Puerto Rican Tanager		PR
Puerto Rican Spindalis		PR
Antillean Euphonia		PR
Puerto Rican Bullfinch	(Puerto Rican subspecies; 100% globally)	PR
Grasshopper Sparrow	(Puerto Rican subspecies)	PR

**Tier III. Additional State, Territorial Listed Species (drawn from species in Tier IV)**

Least Grebe		PR
Great Blue Heron		PR
Great Egret		PR
Snowy Egret		PR

**Tier IV. Additional Local or Regional Interest Species (also Stewardship Species identified by Avifaunal Biome supporting vast majority of breeding population)**

Glossy Ibis		PR
Northern Pintail	(winter)	MA
Blue-winged Teal	(winter)	MA
Lesser Scaup	(winter)	MA

Northern Harrier	(winter)	PR
Osprey		PR
Merlin	(mostly transient)	PR
Peregrine Falcon	(mostly transient)	PR
Sora	(winter)	PR
Common Moorhen		PR
Semipalmated Plover	(non-breeding)	PR
Killdeer		PR
Greater Yellowlegs	(non-breeding)	PR
Spotted Sandpiper	(non-breeding)	PR
White-rumped Sandpiper	(transient)	PR
Royal Tern	(115-315 pairs, >25% in West Indies)	PR
Sandwich Tern	(800-3,600 pairs, 28-71% in West Indies)	PR
White-winged Dove		PR
Mourning Dove		PR
Yellow-billed Cuckoo		PR
Common Nighthawk		PR
Chuck-will's-widow	(Rare, winter)	PR
White-eyed Vireo	(Rare, winter)	PR
Yellow-throated Vireo	(Rare, winter)	PR
Magnolia Warbler	(Northern Forest Biome, winter)	PR
Yellow-throated Warbler	(winter)	PR
Palm Warbler	(Northern Forest Biome, winter)	PR
Blackpoll Warbler	(transient)	PR
Black-and-white Warbler	(winter)	PR
American Redstart	(winter)	PR
Ovenbird	(winter)	PR
Northern Waterthrush	(winter)	PR
Hooded Warbler	(Rare, winter)	PR
Indigo Bunting	(non-breeding)	PR
Bobolink	(transient)	PR
Baltimore Oriole	(transient)	PR

\*

**WL=WatchList** score used for Continental Scoring (PIF Approach); species with WL SUBTOT combined scores of (1) 15 or more, (2) 14 with Tmax+PT  $\geq$ 5, or (3) with 13 with PT=5 are identified. using formula:

Combined Score = PT + PS + maximum of (BD or ND) + maximum of (TB or TN)

#### Tier=

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

*Species with multiple causes for concern across their entire range:* These species are considered by many to be of highest continental concern and of highest priority for conservation actions at national and international scales. A majority of these are legally listed as Endangered or Threatened in either the U.S. or Canada, and as such have recovery plans in place. Notable in this group, however, are several species without legal status, including Bicknell's Thrush and Saltmarsh Sharp-tailed Sparrow.

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

widespread or with moderately large populations. Many of these species still number in the millions (e.g. Dickcissel, Wood Thrush), but are threatened with serious reductions in population or geographic range in the future. Several other species (e.g. Swallow-tailed Kite, Mangrove Cuckoo, Elegant Trogon) are fairly widespread outside the U.S. and Canada, but are threatened in the U.S. portion of their range. Five species are afforded U.S. federal legal status in part of their range or for a particular recognized subspecies. This group also includes four resident game bird species with seriously declining populations.

*Species with restricted distributions or low population size:* These species are on the Watch List because they are restricted to a small range or have small global populations (often both). Many of these species are not known to be declining or seriously threatened at present, but many others are, (e.g. Spotted Owl, Montezuma Quail, Bendire's Thrasher, Rufous-winged Sparrow, Audubon's Oriole). We recognize that these species with small populations and restricted range are particularly vulnerable to relatively minor changes from current conditions, whether or not their populations are currently in decline.

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

**Stewardship Species:** Stewardship Species, whether on the Watch List or not, are of continental importance because they represent all the large biogeographic regions in North America. They are broadly distributed across Canada and the U.S. during the breeding seasons, in a pattern that mirrors the richness of all landbird species. Winter Stewardship Species are much more heavily concentrated in the southern U.S., particularly the southwest and into Mexico, and along the U.S. west coast. Stewardship actions that preserve healthy populations of these species will address the PIF goal of 'keeping common birds common.' These species, which are both of high overall concern and also largely dependent on a single biogeographic region, merit special attention for conservation action within their core range.

**Component Scores to determine Continental WatchList (minus AI) and Regional Scores (and all smaller geographical units, Bird Conservation Regions, Physiographic Areas, States, Provinces, Territories, etc.) are defined as follows:**

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

- 5=Definite decrease
- 4=Possible decrease
- 3=Trend uncertain, No data
- 2=Possible increase, stable
- 1=Definite increase

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

Significant increase (BBS trend $\geq$ 1.36%/yr, $P \leq$ 0.10, $df >$ 13)	1
Possible increase ( $\geq$ 0.47 to 1.36%/ yr, $P \leq$ 0.35, w/any df)	2a
Possible increase ( $\geq$ 1.36%/yr, $0.1 < P \leq$ 0.35, $df >$ 13)	2a
Possible increase ( $\geq$ 1.36%/yr, $P \leq$ 0.10, $df <$ 13)	2a

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

**PS=Population Size** based on best population estimates globally

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

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

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

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

- 5=Very Local Distribution (<500,000 km<sup>2</sup>, or very restricted coastal areas or interior uplands)
- 4=Local Distribution (>500,000 and <1,000,000 km<sup>2</sup>, or <1,600 km of coast)
- 3=Moderate Distribution (>1,000,000 and <2,000,000 km<sup>2</sup>, or >1,600 to <5,000 km of coast)
- 2=Widespread (>2,000,000 and <4,000,000 km<sup>2</sup>, or >5,000 to <8,000 km of coast)
- 1=Very Widespread (>4,000,000 km<sup>2</sup>, or >8,000 km of coast)

**SUBTOT=Subtotal of six scores (absent AI)** used to calculate Combined Score for Continental WatchList

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

- 5=Very High relative abundance (~50+% of maximum relative abundance)
- 4=High relative abundance (~25-49% of maximum relative abundance)
- 3=Moderate relative abundance (~10-24% of maximum relative abundance)
- 2=Low relative abundance (~1-9% of maximum relative abundance)
- 1=Peripheral, scattered occurrences.

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

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

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

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

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

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

## APPENDIX B

### Bird-Habitat Relationships for Puerto Rico and Virgin Islands, West Indies.

Conservation Tier	Limestone and montane forests	Mangrove and coastal woodlands	Shrub-scrub	Grassland/ Open lands	Landbird Transients	Marshes/long-legged waders	Open water	Mudflats	Beach front and salt ponds	Nesting seabirds
I a. Multiple concerns continentally	Plain Pigeon	West Indian Whistling-Duck	Yellow-shouldered Blackbird			West Indian Whistling-Duck	West Indian Whistling-Duck		Snowy Plover	White-tailed Tropicbird
	Puerto Rican Parrot	Yellow-shouldered Blackbird				Black Rail			Piping Plover*	Red-billed Tropicbird
	Puerto Rican Nightjar									
	White-necked Crow									
	Bicknell's Thrush*									
	Golden-winged Warbler*									
	Elfin-woods Warbler									
	Puerto Rican Vireo	Mangrove Cuckoo**		Upland Sandpiper*		Wilson's Snipe		Solitary Sandpiper*	Gull-billed Tern	Masked Booby
	Worm-eating Warbler*	Prothonotary Warbler*		Short-eared Owl				Whimbrel*		Red-footed Booby
	Kentucky Warbler*							Semipalmated Sandpiper*		Brown Booby
	Greater Antillean Oriole							Western Sandpiper*		Roseate Tern

Conservation Tier	Limestone and montane forests	Mangrove and coastal woodlands	Shrub-scrub	Grassland/ Open lands	Landbird Transients	Marshes/long-legged waders	Open water	Mudflats	Beach front and salt ponds	Nesting seabirds
I b. High continental threats and/or declining	Mangrove Cuckoo**	White-crowned Pigeon**	Prairie Warbler*	American Golden-Plover*		Little Blue Heron*		Lesser Yellowlegs*	Sanderling*	Audubon's Shearwater
								Stilt Sandpiper*		Least Tern
								Short-billed Dowitcher*		
I c. Local and/or rare continentally	Black Swift**	Lesser Antillean Pewee	Lesser Antillean Pewee	Antillean Nighthawk**		Caribbean Coot	Caribbean Coot		Reddish Egret	Magnificent Frigatebird
	Lesser Antillean Pewee		Adelaide's Warbler						Wilson's Plover*	Bridled Tern
	Blue-winged Warbler*								American Oystercatcher*	
	Adelaide's Warbler								Red Knot*	
	Swainson's Warbler*									
II a. High concern regionally	Black-whiskered Vireo**	Green Heron*	Antillean Mango			Green Heron*		Black-bellied Plover*	Ruddy Turnstone*	Brown Pelican
		Yellow-crowned Night Heron*				Yellow-crowned Night Heron*		Least Sandpiper*		
II b. High threats regionally	Sharp-shinned Hawk	Clapper Rail	American Kestrel	American Kestrel (w/nest trees)		Pied-billed Grebe	Pied-billed Grebe	Greater Flamingo	Willet*	

Conservation Tier	Limestone and montane forests	Mangrove and coastal woodlands	Shrub-scrub	Grassland/ Open lands	Landbird Transients	Marshes/long-legged waders	Open water	Mudflats	Beach front and salt ponds	Nesting seabirds
	Broad-winged Hawk	Yellow "Golden" Warbler	Key West Quail-Dove			Least Bittern*	White-cheeked Pintail			
	Limpkin					Black-crowned Night-Heron*	Ruddy Duck			
	Bridled Quail-Dove					White-cheeked Pintail	Masked Duck			
	Puerto Rican Screech-Owl (VI)					Ruddy Duck				
	Louisiana Waterthrush*					Masked Duck				
						Yellow-breasted Crake				
						Purple Gallinule*				
II c. High responsibility regionally	Scaly-naped Pigeon	Puerto Rican Flycatcher	Antillean Crested Hummingbird	Zenaida Dove		Tricolored Heron*		Black-necked Stilt*	Black-necked Stilt*	Sooty Tern
	Puerto Rican Lizard-Cuckoo	Northern Parula*	Caribbean Elaenia	Gray Kingbird**				Pectoral Sandpiper*	Black Tern*	Brown Noddy
	Puerto Rican Screech-Owl (PR subsp.)	Cape May Warbler*	Puerto Rican Flycatcher	Caribbean Martin**						
	Green Mango		Gray Kingbird**	Cave Swallow						
	Puerto Rican Emerald		Northern Parula*	Grasshopper Sparrow						
	Puerto Rican Tody		Puerto Rican Bullfinch							

Conservation Tier	Limestone and montane forests	Mangrove and coastal woodlands	Shrub-scrub	Grassland/ Open lands	Landbird Transients	Marshes/long-legged waders	Open water	Mudflats	Beach front and salt ponds	Nesting seabirds
	Puerto Rican Woodpecker									
	Puerto Rican Flycatcher									
	Loggerhead Kingbird									
	Red-legged Thrush									
	Northern Parula*									
	Cape May Warbler*									
	Black-throated Blue Warbler*									
	Puerto Rican Tanager									
	Puerto Rican Spindalis									
	Antillean Euphonia									
	Puerto Rican Bullfinch									
III. Additional State Listed						Least Grebe (USVI)	Least Grebe (USVI)			
						Great Blue Heron (USVI)				

Conservation Tier	Limestone and montane forests	Mangrove and coastal woodlands	Shrub-scrub	Grassland/ Open lands	Landbird Transients	Marshes/long-legged waders	Open water	Mudflats	Beach front and salt ponds	Nesting seabirds
						Great Egret* (USVI)				
						Snowy Egret* (USVI)				
IV. Local or regional interest	Chuck-will's-widow*	White-winged Dove	White-winged Dove	Northern Harrier	Merlin*	Glossy Ibis	Northern Pintail	Semipalmated Plover*		Royal Tern
	Yellow-throated Vireo*	Yellow-billed Cuckoo*	Yellow-billed Cuckoo*	Killdeer	Peregrine Falcon*	Sora	Blue-winged Teal*	Greater Yellowlegs*		Sandwich Tern
	Magnolia Warbler*	Yellow-throated Warbler*	White-eyed Vireo*	Mourning Dove	Common Nighthawk*	Common Moorhen*	Lesser Scaup	Spotted Sandpiper*		
	Blackpoll Warbler*	Palm Warbler*	Indigo Bunting*	Indigo Bunting*	Bobolink*		Osprey*	White-rumped Sandpiper*		
	Black-and-white Warbler*	Blackpoll Warbler*			Baltimore Oriole*					
	American Redstart*	Black-and-white Warbler*								
	Ovenbird*	American Redstart*								
	Hooded Warbler*	Northern Waterthrush*								
		Hooded Warbler*								

\*Nearctic-Neotropical Migrant species, those species with populations principally breeding in temperate North American areas that winter principally in tropical North American and/or South America areas.

\*\*Intratropical Migrants species, those species breeding in the northern tropical areas of North America that winter principally further south in tropical North America and/or South America areas.

## APPENDIX C

### USFWS Species of Conservation Concern (2002) in the Caribbean Islands–Puerto Rico and U.S. Virgin Islands only (BCR 69)

Audubon's Shearwater  
White-tailed Tropicbird  
Red-billed Tropicbird  
Masked Booby  
Brown Booby  
Red-footed Booby  
Magnificent Frigatebird  
West Indian Whistling-Duck  
White-cheeked Pintail  
Masked Duck  
Ruddy Duck (resident *jamaicensis* ssp. only)  
*Peregrine Falcon*  
Black Rail  
Yellow-breasted Crake  
Caribbean Coot  
Limpkin  
Snowy Plover  
Wilson's Plover  
American Oystercatcher  
Semipalmated Sandpiper  
Stilt Sandpiper  
Least Tern  
White-crowned Pigeon  
Key West Quail-Dove  
Bridled Quail-Dove  
Short-eared Owl  
Black Swift  
Lesser Antillean Pewee  
Puerto Rican Flycatcher  
Puerto Rican Vireo  
Bicknell's Thrush  
Yellow Warbler (resident *cruciana* ssp. only)  
Black-throated Blue Warbler  
Adelaide's Warbler  
Prairie Warbler  
Elfin-woods Warbler  
Worm-eating Warbler  
Northern Waterthrush  
Louisiana Waterthrush  
Grasshopper Sparrow  
Greater Antillean Oriole