

The South Atlantic Migratory Bird Initiative Implementation Plan

*An Integrated Approach to Conservation
of “All Birds Across All Habitats”*





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Version 3.3
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*Katy Malloy, formerly with The Nature Conservancy, was instrumental in assisting in the completion of this plan. Katy was a Lands Conservation Specialist with TNC, and her organizational and GIS skills enabled this plan to be completed and approved in 2005. Thank you Katy for your hard work and dedication to make this plan a success.

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The following document, “The South Atlantic Migratory Bird Initiative Implementation Plan – An Integrated Approach to Conservation of All Birds Across All Habitats”, is fully endorsed and supported by the Management Board of the Atlantic Coast Joint Venture. This Plan represents one of the initial efforts in North America to integrate the objectives of existing and emerging bird conservation plans under the North American Bird Conservation Initiative into a single plan that land managers, biologists, administrators, and private landowners can use to achieve common goals and objectives for bird conservation across a regional landscape.

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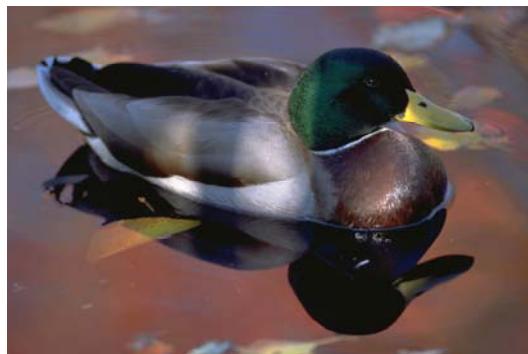
EXECUTIVE SUMMARY

The South Atlantic Migratory Bird Initiative (SAMBI) is a vision and process of integrated bird conservation planning and implementation of the Management Board of the Atlantic Coast Joint Venture (ACJV). This vision and process began in 1999 when the North American Bird Conservation Initiative (NABCI) was emerging as a framework for integrated bird conservation planning in North America. SAMBI is a partnership of traditional joint venture partners (federal, state, non-governmental, and private) and new partners that are dedicated to delivering conservation of “all birds across all habitats” in the south Atlantic coastal plain of the United States. This effort was the first effort of its kind under the framework of NABCI by a joint venture, and this plan was approved by the Management Board of the ACJV in July 2005.

This Plan provides a regional scale framework for the conservation of waterfowl, shorebirds, waterbirds, landbirds, and upland game birds. This framework utilizes existing national and regional plans of the North American Waterfowl Management Plan, United States Shorebird Conservation Plan, Partners In Flight, Waterbird Conservation of the Americas, and the Northern Bobwhite Conservation Initiative, to build a framework for regional bird conservation. This framework seeks to integrate common goals and objectives of these national and regional plans,

providing conservationists a strategy for meeting the challenge of sustaining healthy ecosystems and healthy bird populations in the midst of increasing threats along the Atlantic Coast.

The South Atlantic coastline and coastal plain is under extreme threat of commercial, industrial, and residential development. However, there is opportunity to conserve much of the habitat that remains. This plan identifies priority species, priority habitats, priority areas, and strategies to achieve the conservation of “all birds across all habitats” in this region. This Plan is a result of the collaboration of federal, state, non-governmental, and private interests to build a cohesive strategy for bird conservation in the southeastern United States. Pelagic bird conservation is addressed, and international opportunities for bird conservation are also explored. SAMBI provides a regional framework for the conservation of birds and bird habitats that has implications at multiple scales: local, state, regional, pelagic, international, and hemispheric.



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I. INTRODUCTION

A. Mission

The South Atlantic Migratory Bird Initiative (SAMBI) of the Atlantic Coast Joint Venture (ACJV, <http://acjv.org>) proposes to deliver a habitat conservation strategy for the conservation of "all birds across all habitats," consistent with and complimentary to international, national, regional, and local migratory bird planning efforts. This conservation strategy is based on a strong biological foundation and fostering partnerships at all levels of implementation (international, national, regional, local) through a strong network of conservation partners, including federal, state, non-governmental organizations, and private landowners.

B. Vision

The SAMBI proposes to integrate planning efforts between the four major migratory bird planning initiatives: [North American Waterfowl Management Plan](#), [Partners In Flight](#), [United States Shorebird Conservation Plan](#), [Waterbird Conservation for the Americas](#), and other single species bird conservation initiatives (e.g. [Northern Bobwhite Conservation Initiative](#)), seeking common goals and objectives for habitat conservation to sustain, maintain, and increase populations of resident, migrating, and wintering birds in the SAMBI area.

C. Boundaries of the Planning Area

The planning area or boundary for the South Atlantic Migratory Bird Initiative (SAMBI) is the eastern portion of Bird Conservation Region (BCR) 27, the Southeastern Coastal Plain ([Figure 1](#)). The northernmost boundary in Virginia and the southeastern most boundary in Florida have been modified since the original boundaries of BCRs were delineated. These changes resulted from bird conservation partners in each of these states recognizing that the boundaries needed to be adjusted to reflect bird conservation priorities. Additionally, the majority of the western portion of BCR 27 is not addressed in this plan because the ACJV has no administrative responsibilities west of current boundary of the planning region.

This large and diverse area encompasses the coastal plain of Florida, Georgia, South Carolina, North Carolina, and Virginia, the western boundary being the Fall Line that marks the transition between the coastal plain and the hilly piedmont. The northern boundary lies in southeast Virginia and is delineated by the watershed boundary between the Chowan River Basin and the Lower James River Basin which includes the Great Dismal Swamp and Back Bay National Wildlife Refuges. The southeastern boundary is in northeastern Florida, and is a transitional zone into Peninsular Florida, where coastal plain plant communities become dominated by tropical plant communities, such as black mangrove and scrub communities. This southernmost boundary generally is just south of Fort Matanzas National Monument on the Atlantic Coast, north up the Matanzas River, westward through St. Johns County south of St. Augustine, westward through Clay County, running through the northern portion of Camp Blanding and Gold Head Branch State Park, then north of Gainesville, Florida, and south to a point,

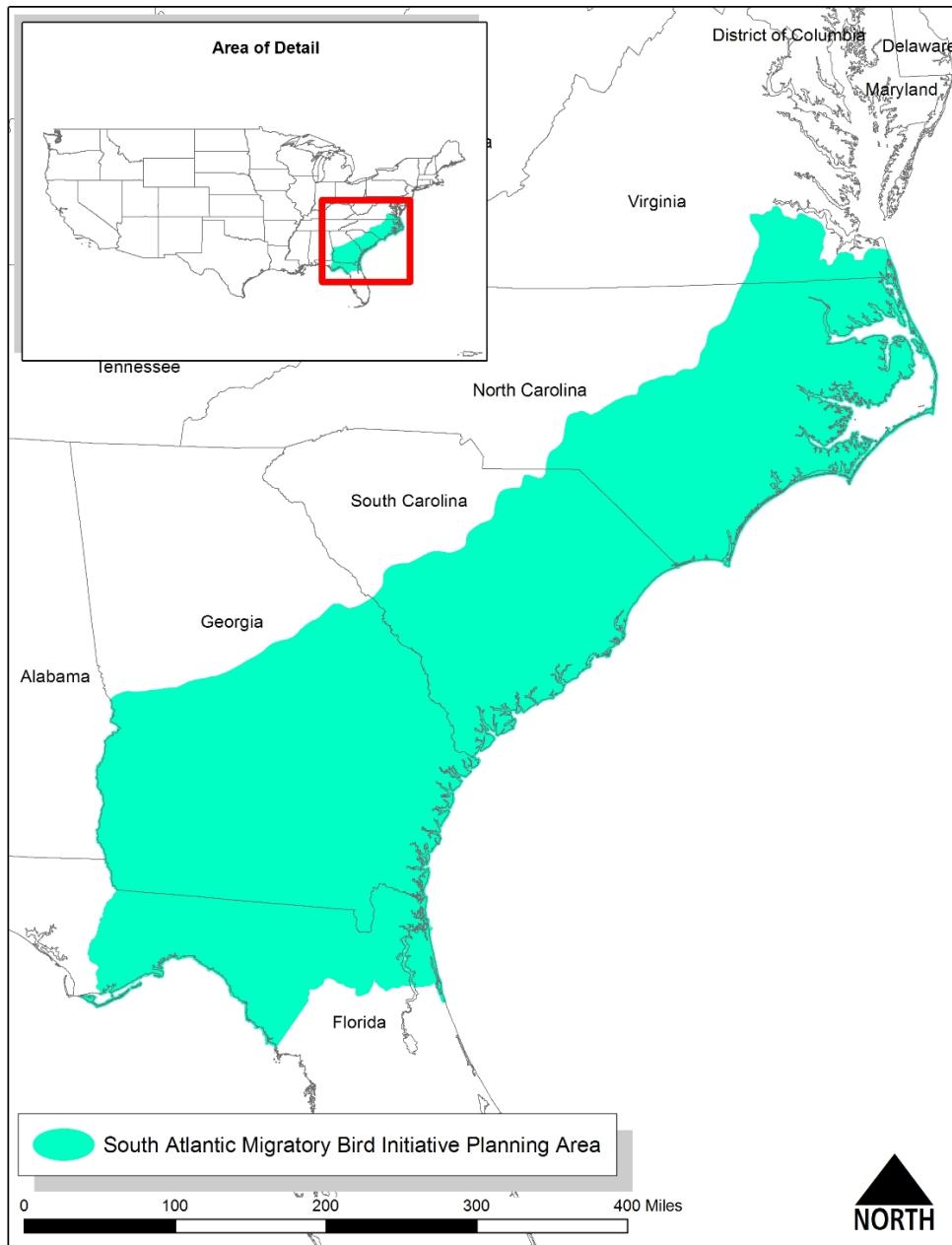


Figure 1. Planning Area for the South Atlantic Migratory Bird Initiative (SAMBI)

approximately midway between the Lower Suwanee National Wildlife Refuge and Cedar Keys National Wildlife Refuge. The Gulf of Mexico forms the remaining segment of the southern boundary. The westernmost boundary is the Georgia-Alabama border south down through the center of the Apalachicola River Basin to the Gulf of Mexico. Portions of the southern and eastern boundaries of southeastern coastal plain are the Gulf of Mexico and Atlantic Ocean respectively, but the SAMBI planning area extends well offshore to include parts of the Southeast U.S. Continental Shelf (BCR 77) and the near shore waters of the Gulf of Mexico pelagic BCR (74) ([Figure 2](#)). The waters addressed in this plan include all coastal offshore waters adjacent to the terrestrial portion of the SAMBI planning area in the Gulf of Mexico and waters of the Atlantic Ocean that extend to and beyond the Gulf Stream where high priority

oceanic birds inhabit. The remainder of BCR 27 not addressed in this plan largely encompasses the East Gulf Coastal Plain (EGCP) physiographic area and will be addressed in future planning efforts ([Figure 2](#)). Similar planning efforts are ongoing for this new Joint Venture.

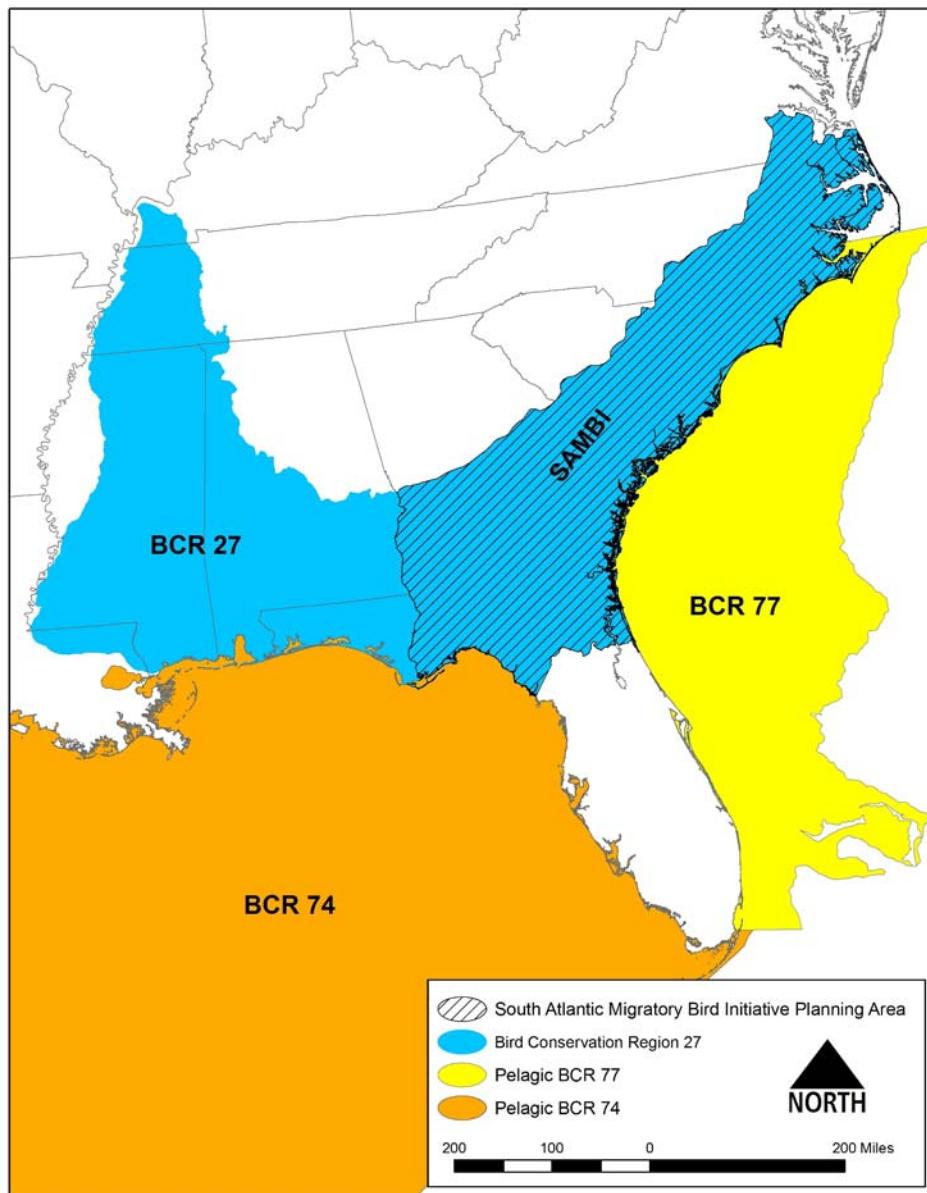


Figure 2. Pelagic Bird Conservation Regions (74 – Gulf of Mexico, 77- Southeast U.S. Continental Shelf), the SAMBI Planning Region, and the East Gulf Coastal Plain.

D. BACKGROUND

One of the original waterfowl Joint Ventures formed under the North American Waterfowl Management Plan in 1988, the Atlantic Coast Joint Venture (ACJV) has evolved both geographically and conceptually from its original delineated boundaries in 1988 ([Figure 3](#)) to

include the 17 Atlantic Flyway states and the Commonwealth of Puerto Rico ([Figure 3](#)). With these expanded boundaries came expanded responsibilities for the conservation of waterfowl and other wetland associated species. During this period of ACJV growth, several other bird conservation initiatives had begun planning at various scales. These initiatives included Partners in Flight (Pashley et al. 2000), United States Shorebird Conservation Plan (Brown et al. 2001), and the Waterbird Conservation for the Americas (Kushlan et al. 2002). These initiatives developed continental, national or regional plans that addressed species population and habitat priorities and goals.

The North American Bird Conservation Initiative ([NABCI](#)) was established to integrate the common goals and objectives of these initiatives and create a more efficient mechanism for the delivery of bird conservation (U.S. NABCI Committee 2000). Ecological planning units known as Bird Conservation Regions (BCRs) were developed by NABCI to help planning within physiographic regions of similar habitat types and bird species composition. Also, other single species bird conservation initiatives have been or are being developed for Northern Bobwhite (Dimmick et al. 2002), Wild Turkey (*Meleagris gallapavo*) (Dave Wilson pers. comm.), and American Woodcock (James R. Kelley pers. comm.).

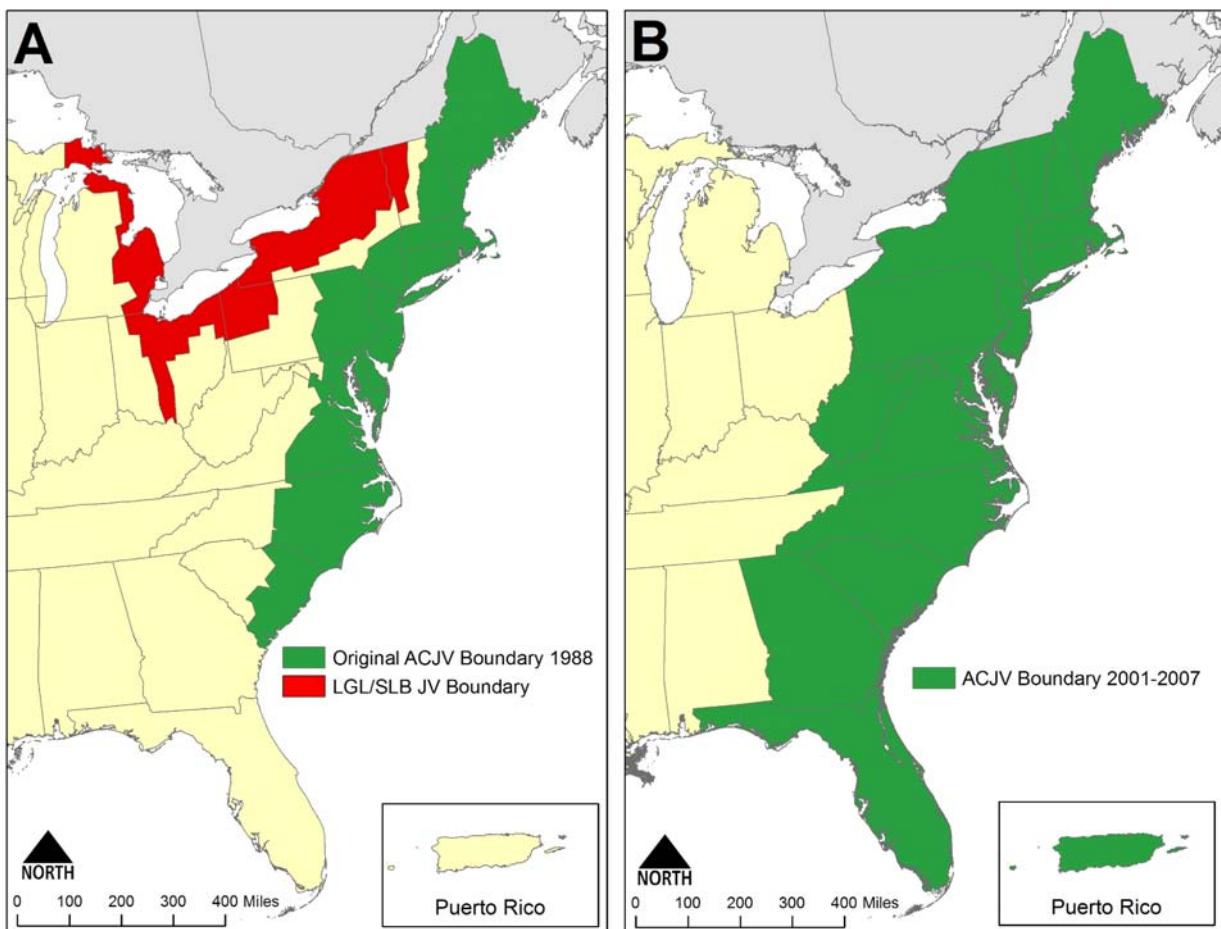


Figure 3. Administrative Boundaries of the Atlantic Coast Joint Venture. Original boundary circa 1988 (Panel A), 2001-2007 boundary (Panel B), and current boundary (Panel C).

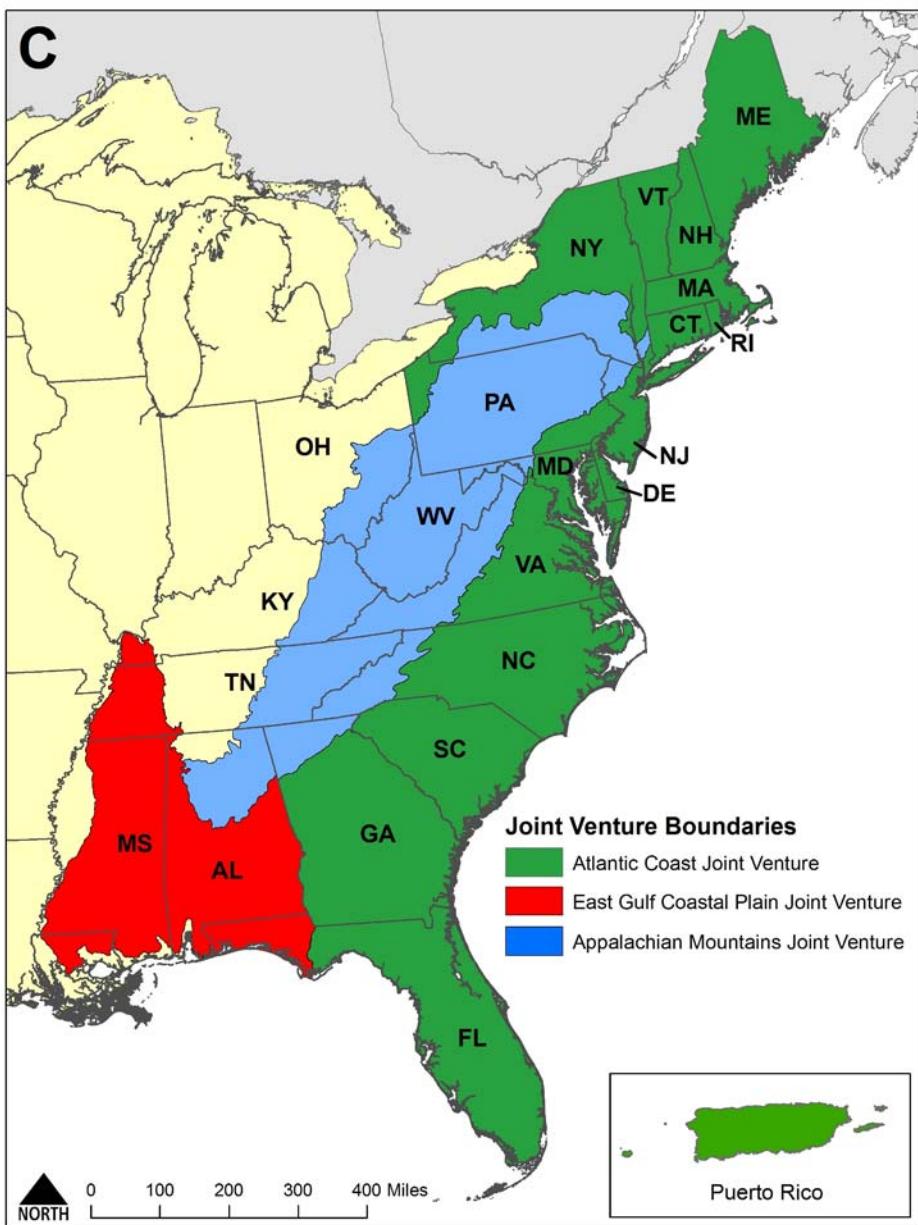


Figure 3. Administrative Boundaries of the Atlantic Coast Joint Venture. Original boundary circa 1988 (Panel A), 2001-2007 boundary (Panel B), and current boundary (Panel C).

In March 1999, the Management Board of the Atlantic Coast Joint Venture unanimously adopted and embraced the framework of NABCI to deliver conservation of “all birds across all habitats.” The ACJV was the first NAWMP Joint Venture to officially begin planning efforts under the framework of NABCI. The first effort of this integrated bird conservation planning vision within the ACJV began in 1999 in the eastern portion of the Southeastern Coastal Plain Bird Conservation Region (BCR 27). Two workshops were held in 1999 to begin the process of integrated bird conservation in BCR 27. A third meeting was held in February 2000.

II. APPROACH AND PLANNING PROCESS

In May 1999, members of the Management Board requested staff of the ACJV to plan and conduct an integrated bird conservation planning in the southeast, initially focusing on Georgia, South Carolina, and North Carolina. Approximately 45 land managers, biologists, scientists, administrators, and planners representing interests of five states (Florida, Georgia, South Carolina, North Carolina, Virginia), including federal, state, non-governmental, and private entities, and with expertise in waterfowl, shorebird, landbird, and waterbird conservation met in June 1999 near Garnett, South Carolina to begin the process of integrated bird planning and implementation.

The objectives of the workshop were to: 1) develop population and habitat objectives for priority species, 2) delineate “all bird” focus areas, 3) identify priority species and habitats, 4) develop projects for implementation, and 5) develop a long term dynamic framework for integrated bird conservation planning in BCR 27. This initiative became known as the South Atlantic Migratory Bird Initiative (SAMBI). Because the ACJV administratively encompasses only a portion of BCR 27, the planning area was limited to the coastal plain of Florida, Georgia, North Carolina, South Carolina, and Virginia, although a small portion of Alabama is ecologically included in this region, and is therefore shown on all maps of the SAMBI planning area ([Figure 1](#), [Figure 2](#)).

The first workshop opened with reports on the status of bird conservation planning for each of the major bird initiatives, followed by presentations on several different approaches to developing population and habitat objectives for shorebirds and waterfowl in the United States. The purpose of these presentations were to provide information about the ACJV, the status and evolution of bird conservation planning in the United States and North America, and demonstrate that a vision of integrated bird conservation could become a reality through a coordinated effort. All sessions, breakout and plenary, were conducted with a facilitator. To prepare for the first workshop, all attendees were briefed concerning information and materials needed to conduct a successful workshop. The structure of the first workshop centered on breakout groups by state, with experts in waterfowl, landbirds, shorebirds, and waterbirds, present. Other attendees with interests in a particular state were free to attend and participate in assisting each breakout group with development of its objectives. Attendees with interests in all states, both biologically and administratively, attended multiple breakout sessions, providing input for each group’s assigned tasks. These groups, known as State Working Groups, became the fundamental planning and implementation body for SAMBI. Technical personnel from each state were collectively called the BCR Technical Committee. In the first workshop, the primary objectives of the breakout groups were to:

- 1) delineate “all bird” focus areas,
- 2) develop strategic population and habitat objectives for each major bird group or at least representative or high priority species within each bird group,
- 3) identify preliminary projects for implementation and
- 4) develop an outline for a long term framework for bird conservation in the South Atlantic Coastal Plain.

During this process, State Working Groups were asked to identify information gaps and needs relative to developing habitat and population objectives for BCR 27. Additionally, the entire group was asked to express their hopes and concerns about the meeting’s purpose, and their

vision for what this effort might be if successful. After the breakout and general sessions were complete, an open discussion was held on the process undertaken at this meeting, noting comments on how the process could be improved. In closing the first workshop, action items and future activities were identified by the larger group.

The second workshop was held on November 4-5, 1999, in Greensboro, North Carolina. The structure of the second workshop was different from the first. There were no breakout sessions, meeting attendance was reduced, and attendees were comprised mostly of technical personnel. The primary focus of the second meeting was to report and present to the group the completion of action items from the first workshop, prioritize habitats and species, prioritize habitat conservation needs, prioritize projects by state, develop research needs, and begin developing a project to be submitted to the North American Wetlands Conservation Act (NAWCA) for funding. Action items for the group and each State Working Groups were generated at the end of the workshop.

A third meeting was held on January 19, 2000, in St. Petersburg, Florida. The primary purpose of this meeting was solely devoted to developing a multi-state, multi-project proposal to be submitted for funding through NAWCA using a new integrated framework of bird conservation planning in the southeastern United States.

A. State Working Groups

Because it is difficult for conservationists from all five states to meet on a regular basis, it became logical to develop State Workings Groups to coordinate planning and implementation at the state level, and to coordinate activities between the five states. State Working Groups have local knowledge of resources, existing partnerships, threats to the landscape, and strategies to achieve conservation at the state level, and thus, became the basic functional unit of SAMBI to plan and implement the conservation of “all birds across all habitats.” State Working Groups can develop and network more extensive partnerships than the large group, making the delivery of bird habitat conservation more efficient at the state level. Each State Working Groups consists of federal, state, NGO, and private interests with knowledge of the major bird initiatives and with expertise in planning, implementation, and developing partnerships. State Working Groups continue to meet on their own to develop projects, refine biological planning, and develop partnerships. State Working Groups have been critical to the success of SAMBI.

B. Setting Population and Habitat Objectives

Population and/or habitat objectives were derived for many of the priority species of each major bird initiative based upon existing national and regional plans (Pashley et al. 2000, Hunter et al. 2001, Brown et al. 2001, Hunter et al. 2002, Kushlan et al. 2002), bird initiative workshops, and local/regional knowledge and expertise. These regional plans are quite detailed in objectives for both population and habitat for many of the high priority species. Because the SAMBI planning area is similar to the same planning area or area of geographic importance for priority species in these plans, objectives outlined in these plans are directly applicable to SAMBI.

Similar objectives for waterfowl are now being developed in a regional plan, and current objectives for waterfowl within the ACJV are area based and categorized by state and focus area (U.S. Fish and Wildlife Service 1988b). Factors influencing existing waterfowl objectives have

significantly changed since 1988, warranting a revision of the current ACJV Implementation Plan and its objectives. For SAMBI, the Noffsinger method (Noffsinger 1999, unpubl.) was used to calculate waterfowl objectives by state (Balkcom pers. comm., Harrigal pers. comm., Luszcz pers. comm.). The Noffsinger method is a modified calculation of the bioenergetics model that was used in the Mississippi Alluvial Plain to calculate both waterfowl and shorebird objectives (Loesch et al. 2000).

The SAMBI BCR Technical Committee also developed habitat and/or population objectives for species they felt important but that were not specifically addressed in regional plans.

Additionally, they adjusted existing population and habitat objectives for some priority species to better address local conservation needs. Finally, State Working Groups of the BCR Technical Committee stepped down regional objectives to state objectives for certain species. For example, the goal for Swallow-Tailed Kite in the Partners In Flight Bird Conservation Plan for the South Atlantic Coastal Plain (SACP) is to provide eight patches of at least 40,500 ha of bottomland hardwood forests. However, this plan does not indicate where in the SACP these large forest patches should be distributed. State Working Groups evaluated the availability and potential of such habitat within their respective states and assigned a portion of these eight patches to individual states. As an example, Georgia and South Carolina allocated, respectively, two and three patches of the recommended eight patches to their states in specific areas, thus targeting these areas for conservation. Additionally, by allocating these patches to their states, the Swallow-tailed Kite goal also incorporated goals for Wayne's Black-throated Green Warbler and Swainson's Warbler where the breeding ranges of these species overlap.

III. DETERMINING FOCUS AREAS, PRIORITY SPECIES, AND PRIORITY HABITATS

A. Delineation of Focus Areas

A primary objective of SAMBI was to delineate focus areas, areas in which conservation actions are implemented for high priority species and habitats. Focus areas are biologically based, and conservation actions are dictated by both biological foundation and opportunity. It is important that focus areas be large enough to provide all the necessary seasonal requirements for a wide variety of species. At the same time, small, distinct and sometimes disjunct areas that are equally important to high priority species should be included. Essentially, focus areas are important to the life history of a wide variety of high priority birds where financial and conservation resources can be expended to have the maximum positive impact on these bird populations (Hayes et al. 2002).

During the first workshop, SAMBI participants noted that focus areas should link important habitat areas, guard against fragmentation, include upland areas, and link existing protected areas. Public lands, other protected areas, and areas of high avian resource value were considered to serve as anchors from which to base delineation of focus areas ([Figure 4](#)). Existing waterfowl focus areas were used as examples or a starting point to delineate "all bird" focus areas. Waterfowl focus areas had already been described (U.S. Fish and Wildlife Service 1988b), and were known to provide critical habitat for waterfowl, shorebirds, and waterbirds. Additionally, SAMBI participants agreed that focus areas should be places where all disciplines could work together, ignoring geopolitical boundaries.

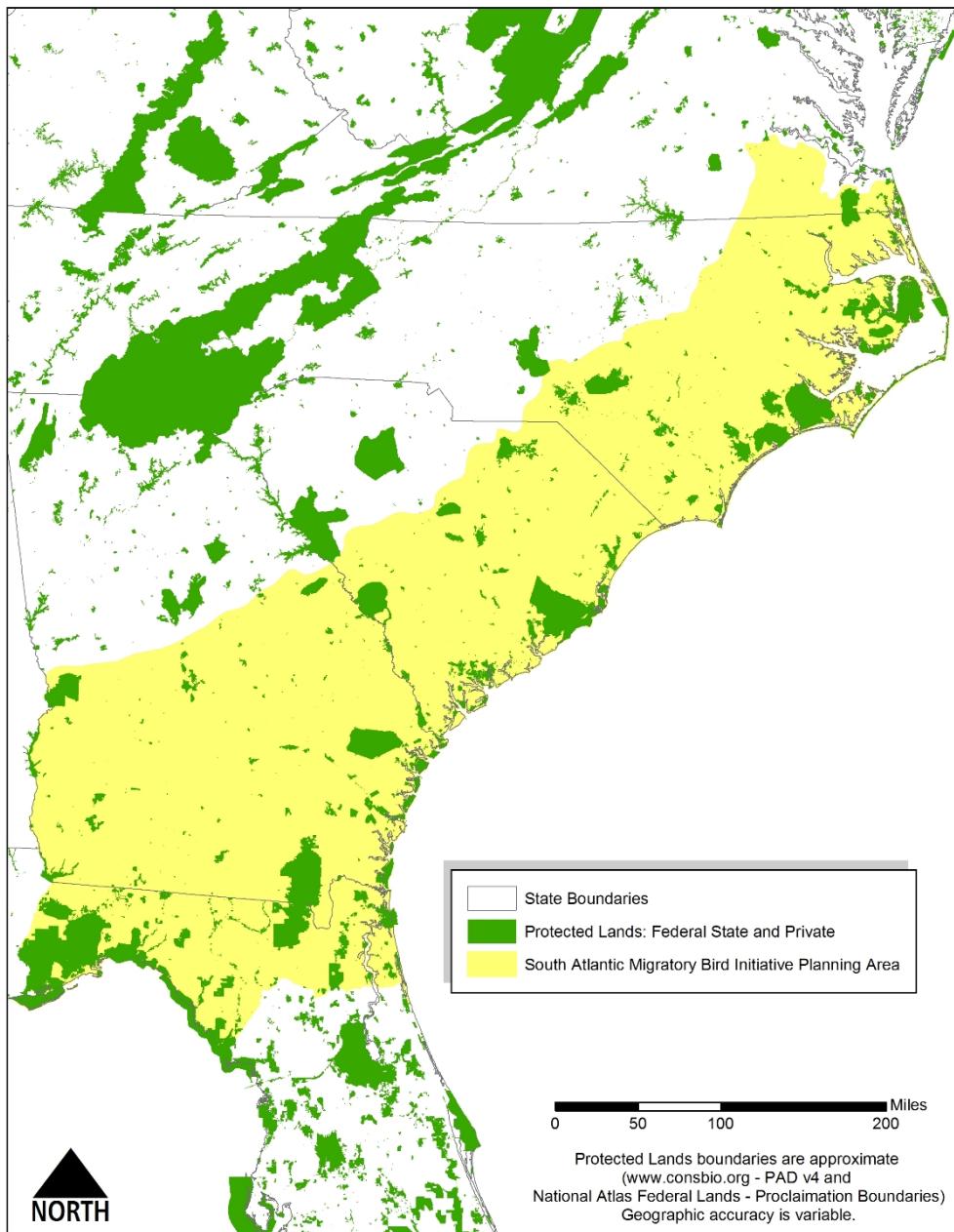


Figure 4. Map of Protected Lands (Federal, State and Private) within the SAMBI Region

State Working Groups were asked to delineate distinct focus areas for landbirds, shorebirds, waterbirds, waterfowl, or any other bird group (i.e. Northern Bobwhite/early successional/grassland species) in which to focus their conservation efforts. We used 1:250,000 topographic maps to delineate distinct focus areas for each bird group. All five states delineated these focus areas (see States section). Once these areas were delineated for each bird group, the areas were superimposed, displaying the overlap of focus areas. This layering of the various bird focus areas for each State can be displayed to represent one large “all bird” focus area for each state, and each of the five states can be combined to display one large “all bird” SAMBI focus

Area. Additionally, focus areas for each bird group for the entire SAMBI area can be displayed individually ([see States section](#)).

This effort allowed the participants to visualize differences in amounts and types of habitats across their own jurisdiction as well as across the entire BCR. Some states, such as North Carolina, worked on distinct focus areas for Northern Bobwhite and other early successional/grassland bird species through a new program called CURE (Cooperative Upland Habitat Restoration and Enhancement) where landscape scale focus areas were delineated to direct efforts for the conservation of high priority early successional species ([Figure 7](#)). Additionally, focus areas for early successional/grassland species have been identified in South Carolina ([Figure 8](#)) and Georgia ([Figure 9](#)).

Focus areas for each bird group, whether at the State or regional level (SAMBI), are important to each group for conservation projects, contributing to conservation of priority bird species at the local, regional, flyway, and continental level. Additionally, SAMBI partners recognize that these focus areas are important for pursuing single bird group projects, such as for waterfowl or shorebirds, or even projects focused on a single high priority species. Thus, projects in focus areas need not necessarily contribute to multiple bird group conservation, but contribute to regional biodiversity. The break-down of sites allows groups that function on a smaller scale, such as many non-profits and state agencies, to contribute to the conservation action already being taken on the larger, national scale by federal agencies.

B. Determining Priority Species

Priority species for landbirds, shorebirds, and waterbirds have been identified in each major bird initiative's national and/or regional plans; Partners In Flight (Pashley et al. 2000, Hunter et al. 2001), United States Shorebird Conservation Plan (Brown et al. 2001, Hunter et al. 2002), and the Waterbird Conservation for the Americas (Kushlan et al. 2002). The prioritization process for determining priority species for each bird group is outlined in each of the individual national and regional bird conservation plans ([NABCI](#)). Additionally, priority waterfowl species were selected based upon annual population analyses at the continental level, regional knowledge of waterfowl populations and habitat, local knowledge of waterfowl issues, and North American Waterfowl Management Plan priorities (U.S. Fish and Wildlife Service 1998a, U.S. Fish and Wildlife Service 2004, U.S. Fish & Wildlife Service 2005). The BCR Technical Committee concurred with the list of priority species outlined in the various bird plans, adjusting priorities where applicable, and designating species of special management concern for the SAMBI planning area. Initially, species were not grouped into different categories of priority. However, to be consistent with priority species list in other BCR planning efforts, we have revised the original priority species list using three categories of priority – *Highest, High, and Moderate* ([Table 1](#)).

Highest priority species are those of High Continental and/or Regional Concern in need of **IMMEDIATE** Management Attention, *High* priority species are species of Continental or Regional Concern in need of Management Attention, and *Moderate* priority species are species where monitoring is needed to ensure population persistence, and which may also include additional Federally endangered species, State listed species, and other species of conservation or management interest. Additionally, two other categories are presented, *Nuisance or Depredating Species* and *Game Species Of Local Or State Management And/Or Economic Interest*, both of

which are self-explanatory. Species of local or state management interest are primarily species that are important from a harvest standpoint. Priority species outlined for SAMBI generally occupied priority habitats, therefore encompassing the conservation needs of suites of species. Additionally, regional responsibilities and areas of importance for some species were identified. For example, eastern North Carolina was identified as having both regional responsibility and supporting a highly significant wintering area for Tundra Swan for the entire Atlantic Flyway. Finally, species that were not identified in any regional bird conservation plan, yet identified by the State Working Groups as of importance, were added as high priority species.

TABLE 1. Priority Species List for the South Atlantic Migratory Bird Initiative

Highest Priority		
Ivory-billed Woodpecker (B,E)	Bachman's Warbler (B,E)	Kirtland's Warbler (M)
Red-cockaded Woodpecker (B)	Henslow's Sparrow (B,N)	Saltmarsh Sharp-tailed Sparrow (N)
Cerulean Warbler (B) NC	Painted Bunting (B)	Common Ground-Dove (B)
Loggerhead Shrike (B,N)	Black-throated Green Warbler (B)	Whooping Crane (N)
Bermuda Petrel (N, pelagic)	Audubon's Shearwater (N, pelagic)	Wood Stork (B,N)
Sandhill Crane (B) GA	Purple Gallinule (B)	Common Tern (B,M)
Limpkin (B,N)	American Coot (B)	American Woodcock (B,N)
Piping Plover (B,N)	Snowy Plover (B,N)	Buff-breasted Sandpiper (M)
Whimbrel (N)	Long-billed Curlew (N)	Red Knot (N)
Canada Goose (non-residents, N)	American Black Duck (B,N)	Northern Pintail (N)
Lesser Scaup (N)	Snow Goose (N)	Canvasback (N)
Black Scoter (N)	Redhead (N)	Brant (N)
High Priority		
Bicknell's Thrush (M)	Bachman's Sparrow (B, N)	Brown-headed Nuthatch (B, N)
Prairie Warbler (B)	Swainson's Warbler (B)	Nelson's Sharp-tailed Sparrow (N)
Rusty Blackbird (N)	Le Conte's Sparrow (N)	Northern Bobwhite (B)
Swallow-tailed Kite (B)	Chuck-will's-widow (B)	Eastern Towhee (B,W)
Short-eared Owl (N)	Wood Thrush (B)	Yellow-billed Cuckoo (B)
Chimney Swift (B)	Northern Flicker (B,N)	Field Sparrow (N)
Eastern Kingbird (B)	Brown Thrasher (B)	Grasshopper Sparrow (N)
Northern Harrier (N)	American Kestrel (B)	Eastern Wood-Pewee (B,N)
Vesper Sparrow (N)	White-throated Sparrow (N)	Eastern Meadowlark (B,N)
Seaside Sparrow (B,N)	Prothonotary Warbler (B)	Kentucky Warbler (B)
Red-headed Woodpecker (B,W)	Worm-eating Warbler (B)	Black Rail (B,N)
Black-capped Petrel (N,	Yellow Rail (N)	Black Skimmer (B,N)

pelagic)		
Horned Grebe (N)	Least Tern (B)	Red-throated Loon (N)
King Rail (B,N)	Gull-billed Tern (B)	American Bittern (N)
Tricolored Heron (B,N)	Sandwich Tern (B)	Black Tern (M)
Northern Gannet (N)	White Ibis (B,N)	Razorbill (N, pelagic)
Common Loon (N)	Little Blue Heron (B,N)	Black-crowned Night-Heron (B,N)
Pied-billed Grebe (B)	Least Bittern (B)	Snowy Egret (B,N)
Yellow-crowned Night-heron (B,N)	Glossy Ibis (B,N)	Common Moorhen (B,N)
Greater Shearwater (N, pelagic)	Band-rumped Storm-Petrel (N, pelagic)	Bridled Tern (N, pelagic)
Cory's Shearwater (N, pelagic)	Manx Shearwater (N, pelagic)	Brown Pelican (B)
American White Pelican (W)	American Golden Plover (T)	Red Phalarope (N, pelagic)
American Oystercatcher (B,N)	Wilson's Plover (B)	Semipalmated Sandpiper (M)
Short-billed Dowitcher (W)	Solitary Sandpiper (N)	Upland Sandpiper (M)
Marbled Godwit (M,N)	Least Sandpiper (N)	Stilt Sandpiper (M)
Wilson's Phalarope (M)	American Avocet (N)	Lesser Yellowlegs (N)
Sanderling (N)	Willet (B,N)	Western Sandpiper (N)
Ruddy Turnstone (N)	Dunlin (N)	Wilson's Snipe (N)
Roseate Tern (M)	American Wigeon (N)	Blue-winged Teal (M,N)
Common Goldeneye (N)	White-winged Scoter (N)	White-tailed Tropicbird (M)
Moderate Priority		
Red-shouldered Hawk (B,N)	Coastal Plain Swamp Sparrow (N) NC, VA	Acadian Flycatcher (B)
White-eyed Vireo (B)	Yellow-throated Vireo (B)	Marsh Wren (B,N)
Sedge Wren (N)	Yellow-throated Warbler (B)	Cape May Warbler (M)
Northern Parula (B)	Pine Warbler (B,N)	Blackpoll Warbler (M)
Black-throated Blue Warbler (M)	Hooded Warbler (B)	Summer Tanager (B)
Connecticut Warbler (M)	Bobolink (M)	Orchard Oriole (B)
Indigo Bunting (B)	Bald Eagle (B,N)	Black Vulture (B,N) NC
Northern Harrier (B) VA, NC	Cooper's Hawk (B) NC, SC	Mississippi Kite (B) NC, SC
Barn Owl (B, N) NC, SC	Burrowing Owl (B) FL	Peregrine Falcon (M, N)
Louisiana Waterthrush (B)	Clapper Rail (B,N)	Bonaparte's Gull (N)
Royal Tern (B,N)	Forster's Tern (B,N)	Great Egret (B) VA
Reddish Egret (N)	Sandhill Crane (W)	Black-bellied Plover (N)
Semipalmated Plover (N)	Greater Yellowlegs (N)	Spotted Sandpiper (N)
Pectoral Sandpiper (M)	Mottled Duck (B,N)	

<u>Nuisance or Depredating Species</u>		
Canada Goose (resident populations)	Double-crested Cormorant (non-breeding)	Cattle Egret (replacing other species, health, etc.)
Laughing Gull (where threatening stability of other waterbirds)	Herring Gull (where threatening stability of other waterbirds)	Great Black-backed Gull (where threatening stability of other waterbirds)
<u>Game Species of Local or State Management and/or Economic Interest</u>		
Eastern Wild Turkey (B)	Mourning Dove (B,N)	Virginia Rail (N)
Sora (N)	American Coot (N)	Snow Goose (N)
Gadwall (N)	American Wigeon (N)	Mallard (N)
Blue-winged Teal (N)	Ring-necked Duck (N)	Greater Scaup (N)
Common Goldeneye (N)	Bufflehead (N)	Mallard (N)
Wood Duck (B,N)		

(B=Breeding, N=Non-breeding or Wintering, M=Migrant or Transient, E=Endangered, VA=Virginia, NC=North Carolina, SC=South Carolina, GA=Georgia, FL=Florida)

C. DETERMINING PRIORITY HABITATS

Habitats for each of the bird groups are clearly identified in regional bird conservation plans based on the list of priority species. To describe these habitats in a concise and meaningful manner, they were lumped and placed into categories ([Table 2](#)). State Working Groups often had additional habitats of local importance they wished to have included in the list of priority habitats (see States Section). Essentially all of the priority species listed in the plan are found within one or more of the eight priority habitats.

TABLE 2. Habitat-species suites in the eastern portion of the Southeastern Coastal Plain Bird Conservation Region (BCR 27)

Habitat	Priority Species	Description
1) Grasslands and Associated Habitats	Henslow's Sparrow, Loggerhead Shrike, Northern Bobwhite, Le Conte's Sparrow, Buff-breasted Sandpiper, Sandhill Crane	Grasslands within largely forest-dominated landscapes with pitcher plant bogs, prairies, sedge lands, savannas, barrens, glades, and sod farms
2) Managed and Palustrine Emergent Wetlands and Mudflats	King Rail, Yellow Rail, Black Rail, Least Bittern, American Bittern, Buff-bellied Sandpiper, Stilt Sandpiper, Whimbrel, Northern Pintail, American Black Duck, Ring-necked Duck, Wood Stork	Freshwater marshes and mudflats-freshwater emergent tidal marshes, managed impoundments, dredge spoil, exposed mudflats (managed and shallow water)
3) Early-Successional and Shrub-Scrub	Bachman's Sparrow, Henslow's Sparrow, Loggerhead Shrike, Prairie Warbler, Northern Bobwhite, American Woodcock, Field Sparrow	"Old-field", hedgerows, fire maintained plant communities under mature pine forests, bogs, and remnant cedar (<i>Juniperus spp.</i>) glades
4) Forested Wetlands (Alluvial)	Swallow-tailed Kite, Prothonotary Warbler, Black-throated Green Warbler, Cerulean Warbler, Swainson's Warbler, Yellow-	Bottomland hardwood forests, alluvial forests, and swamp forests, alluvial floodplain, major forest types are

	throated Warbler, Wood Duck, Mallard	cottonwood (<i>Populus spp.</i>), oak (<i>Quercus spp.</i>), oak/hickory (<i>Carya spp.</i>), cypress (<i>Taxodium spp.</i>)/tupelo (<i>Nyssa spp.</i> , and sweetbay (<i>Magnolia spp.</i>)/redbay (<i>Persea spp.</i>)
5) Forested Wetlands (Non-Alluvial): Pocosins, Carolina Bays, Other Non-Alluvial	Black-throated Green Warbler, Swainson's Warbler, Prothonotary Warbler, Worm-eating Warbler, Red-cockaded Woodpecker, Brown-headed Nuthatch, Red-headed Woodpecker, Chuck-will's-widow, Wood Duck, Yellow-throated Warbler, Northern Parula	Pocosins, Carolina Bays, and other non-alluvial wetlands, pond pine dominated pocosins, palmetto (<i>Sabal spp.</i>), laurel oak (<i>Quercus laurifolia</i>), loblolly pine (<i>Pinus taeda</i>)
6) Maritime Communities: <i>Maritime Forest/Shrub-Scrub</i>	Painted Bunting, Prairie Warbler, Common Ground Dove, Northern Parula, Yellow-throated Warbler, Bicknell's Thrush, Kirtland's Warbler, Cape May Warbler, Black-throated Blue Warbler, Connecticut Warbler	Live oak (<i>Quercus virginianus</i>), palmetto (<i>Sabal palmetto</i>), loblolly pine (<i>Pinus taeda</i>), coastal hammocks with numerous understory species, shrub-scrub thickets of wax myrtle (<i>Myrica cerifera</i>) and yaupon holly (<i>Ilex vomitoria</i>)
7) Maritime Communities: <i>Estuarine emergent wetlands</i>	Nelson's Sharp-tailed Sparrow, Salt Marsh Sharp-tailed Sparrow, Seaside Sparrow, Black Rail, Yellow Rail, Black Duck, Wood Stork, Blue-winged Teal	Estuaries - tidal flats, emergent wetlands, and border maritime woodlands
8) Maritime Communities: <i>Beaches and Dunes</i>	Red Knot, Piping Plover, Snowy Plover, Wilson's Plover, Least Tern, Royal Tern, Common Tern, Gull-billed Tern, Black Skimmer, American Oystercatcher, Reddish Egret	Beaches, dunes, overwash areas, oyster bars, rock jetties, dredge spoil areas
9) Maritime Communities: <i>Open Ocean (Gulf Stream)</i>	Black-capped Petrel, Bermuda Petrel, Audubon's Shearwater, Roseate Tern, Black Scoter	Open ocean waters near the Gulf Stream paralleling the South Atlantic Coastal Plain
10) Longleaf / Slash Flatwoods and Savannas and Longleaf Sandhills	Red-cockaded Woodpecker, Northern Bobwhite, Loggerhead Shrike, Prairie Warbler, Bachman's Sparrow, Henslow's Sparrow, Brown-headed Nuthatch, American Kestrel, Red-headed Woodpecker	Longleaf pine (<i>Pinus palustris</i>) flatwoods and savannas, and longleaf sandhills, system is maintained by fire
11) Mature Loblolly	Field Sparrow, Brown-headed Nuthatch, Prairie Warbler, Bachman's Sparrow, Northern Bobwhite, Red-cockaded Woodpecker,	Mature loblolly, shortleaf (<i>Pinus echinata</i>), and slash pine (<i>Pinus elliottii</i>) forest; much of longleaf historic longleaf pine and shortleaf pine have been replaced with loblolly and slash pine stands
12) Short-Rotation "Plantation" Pine	Northern Bobwhite, Bachman's Sparrow, Field Sparrow, Prairie Warbler, Henslow's Sparrow, Wood thrush, Eastern Wood-Pewee, Yellow-throated Vireo, Summer Tanager, Chuck-will's-Widow, Whip-poor-will	Primarily loblolly and slash pine
13) Oak-Hickory/Tulip Poplar (<i>Liriodendron tulipifera</i>)/Pine Forests	For the southern mixed mesic forest types, priority species are the same as for Riparian/Mixed Mesic Hardwoods; Swainson's Warbler, Kentucky Warbler, Acadian Flycatcher, Louisiana Waterthrush, Cerulean Warbler	These are the hardwood-pined mixed forest types. Turkey oak (<i>Quercus laevis</i>) and scrub oak (<i>Quercus spp.</i>) species in the sandhills, and southern mixed mesophytic forests along bluffs and ravines
14) Riparian/ Mixed Mesic Hardwoods (Southern Mixed, Hammocks)	Swainson's Warbler, Kentucky Warbler, Acadian Flycatcher, Louisiana Waterthrush, Cerulean Warbler, Worm-eating Warbler, Wood Thrush, Hooded Warbler	Riparian-streamside areas, bottomlands and all palustrine wetlands on coastal plains and prairies, upland riparian areas; Hammocks-narrow bands of vegetation confined to slopes between upland sand/clayhill

		pinelands and bottomlands
15) Urban/Suburban Backyards, Rural Woodlots	Important for transient nearctic, neotropical species	Riparian areas, mature woods, other non-forested areas
16) Other Inland Habitats	Least Tern, American Avocet, Blue-winged Teal, Wood Duck, Wood Stork, Painted Bunting, Stilt Sandpiper, Semipalmated Sandpiper	Rooftops, dredges spoil areas, flooded croplands, riverbars, lakeshores, pasture and other agricultural lands

IV. DESCRIPTION OF THE SAMBI PLANNING AREA

The following description is of the eastern portion of the southeastern coastal plain (BCR 27), referred to hereafter as the SAMBI Area ([Figure 1](#)). The SAMBI area is essentially the same as the South Atlantic Coastal Plain (SACP) Phyiosgraphic Area of Partners In Flight, except that portion of Alabama that was formerly in the SACP of SAMBI is now outside the SAMBI area as a result of the formation of the East Gulf Coast Joint Venture (EGCJV, [Figure 3D](#)). The SAMBI Area, consisting of approximately 24.2 million hectares, includes parts of Virginia, North Carolina, South Carolina, Georgia, and Florida. SAMBI is home to the largest forested floodplains outside of the Mississippi Alluvial Plain and includes unique non-alluvial wetlands such as the Great Dismal Swamp, pocosins, and Carolina bays. In addition, the largest remnants of former longleaf pine (*Pinus palustris*) ecosystems, and the best remaining examples of "natural" barrier and sea islands, coastal marsh complexes, and maritime forests and woodlands are found in the SAMBI area. Also present within this region are extensive tidal wetlands and commercial forests. Managed impoundments in coastal areas are important to migrating and wintering dabbling ducks, shorebirds, and waterbirds.

Physical characteristics include a predominantly flat, weakly dissected alluvial plain with active fluvial deposition and shore zone processes along coastlines. Elevation ranges from 0m increasing towards the fall line to 219m. Major blackwater rivers (with headwaters in the coastal plain) include Chowan, Waccamaw, Satilla, St. Mary's, Suwanee, and St. John's (originating in Peninsular Florida). Major brownwater rivers (with headwaters originating in the Southern Piedmont or Southern Blue Ridge) include the Roanoke, Tar, Neuse, Cape Fear, Pee Dee, Santee-Cooper, Ashepoo-Combahee-Edisto (ACE), Savannah, Ogeechee, Altamaha, and Apalachicola (Chattahoochee and Flint) rivers. Average annual precipitation is 102-152cm except on the Florida Gulf Coast where it is 133-163cm.

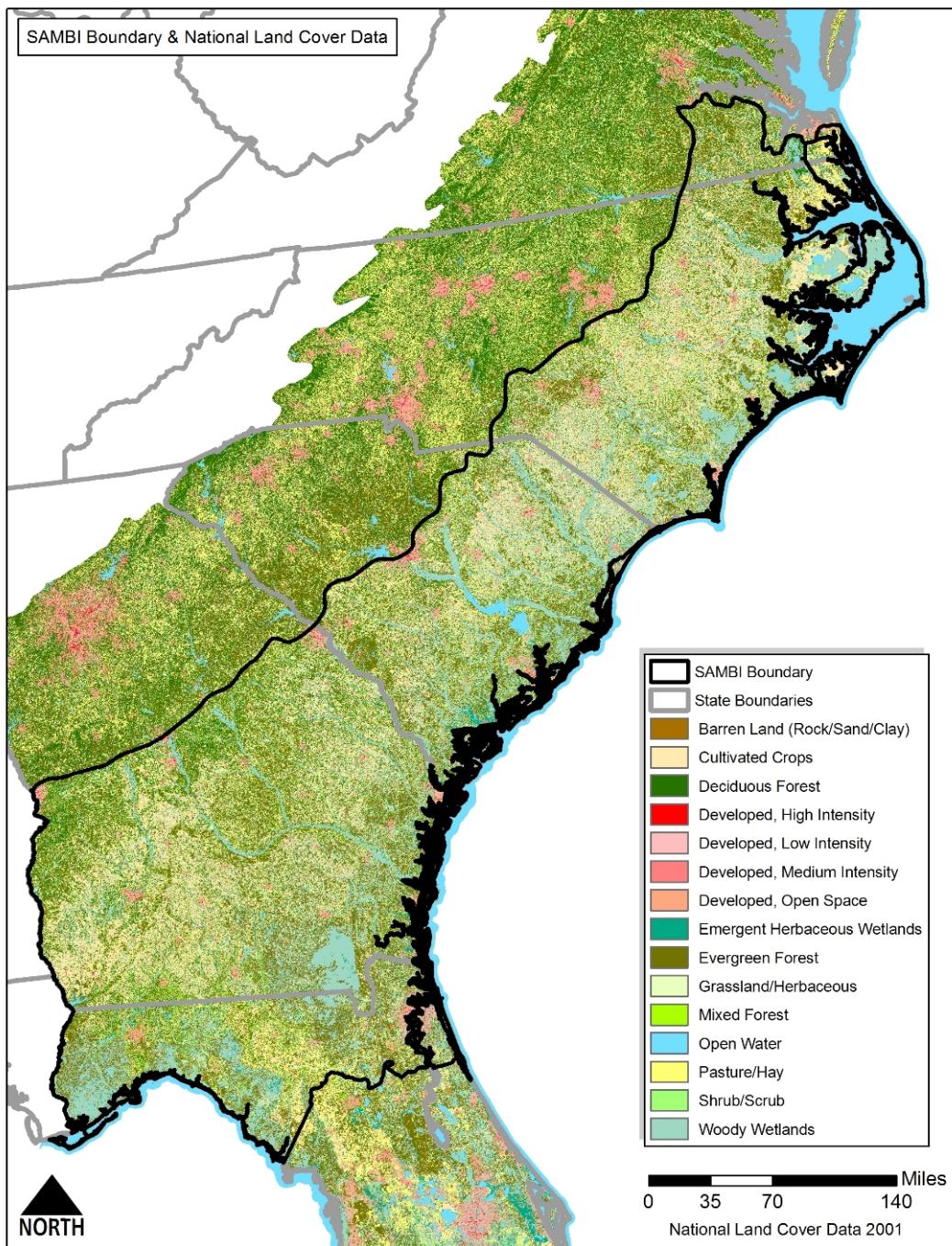


Figure 5. Landcover Types in the SAMBI Planning Area.

Portions of the southern and eastern boundaries of southeastern coastal plain are the Gulf of Mexico and Atlantic Ocean respectively, but the SAMBI planning area extends well offshore to include both the Southeast U.S. Continental Shelf (BCR 77) and the near shore waters of the Gulf of Mexico pelagic BCR (74) ([Figure 2](#)) where the SAMBI planning area is adjacent to these pelagic BCRs. The waters addressed in this plan include all coastal offshore waters adjacent to the terrestrial portion of the SAMBI planning area in the Gulf of Mexico and waters of the

Atlantic Ocean that extend to and beyond the Gulf Stream where high priority oceanic birds inhabit.

Land conversion, for both agricultural and urban expansion, has resulted in a 40 percent loss of natural vegetation (closer to 65 percent along some coastlines) in this physiographic area. Potential natural vegetation (i.e., absent frequent disturbances) is referred to as "southern mixed" forests and oak/hickory/pine (*Quercus spp./Carya spp. Pinus spp.*), with intervening southern floodplain forest and pocosins, as well as live oak/sea oats (*Quercus virginiana/Uniola paniculata*) along coastlines. However, disturbances are frequent and therefore, upland forests historically were characterized by open pine (predominantly longleaf) forests. Today, predominant vegetation remains slash pine (*Pinus elliottii*) (Florida) and longleaf pines, with loblolly pine (*Pinus taeda*) becoming common nearer to the Southern Piedmont and the northern portions of the coastal plain (Figure 7). Oak/gum/cypress (*Quercus spp./Nyssa spp./Taxodium spp.*) forest cover type is common along floodplains and prevalent species include laurel oak (*Quercus laurifolia*), water tupelo (*Nyssa aquatica*), swamp tupelo (*Nyssa biflora*), swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus falcata var. pagodaefolia*), and baldcypress (*Taxodium distichum*). Pond pine (*Pinus serotina*) and Atlantic white cedar (*Chamaecyparis thyoides*) become important within the Lower Coastal Plain, especially in pocosin and other non-alluvial wetland types. Live oak becomes important along coastal areas and frequently is included with other coastal pines and hardwoods in various types of "hammocks."

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

Over 300 bird species occur annually in the SAMBI area as nesting, post nesting dispersers, transients, and /or wintering residents. Among these species, the SAMBI area supports critically important populations for a number of extremely high priority bird species. Species in need of the greatest conservation attention include Henslow's Sparrow (*Ammodramus henslowii*), Wood Stork (*Mycteria americana*), Bachman's Sparrow (*Aimophila aestivalis*), Swallow-tailed Kite (*Elanoides forficatus*), Swainson's Warbler (*Limnothlypis swainsonii*), Painted Bunting (*Passerina ciris*), Black-Capped Petrel (*Pterodroma hasitata*), Bermuda Petrel (*Pterodroma cahow*), Red-Cockaded Woodpecker (*Picoides borealis*), Southeastern American Kestrel (*Falco sparverius paulus*), Wayne's Black-Throated Green Warbler (*Dendroica virens waynei*), Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*), Red Knot (*Calidris canutus*), Piping Plover (*Charadrius melanotos*), and Snowy Plover (*Charadrius alexandrinus*) (gulf coast). Other priority species also of conservation interest include Florida Sandhill Crane (*Grus canadensis pratensis*), White Ibis (*Eudocimus albus*), Loggerhead Shrike (*Lanius ludovicianus*), Cerulean Warbler (*Dendroica cerulea*), Prothonotary Warbler (*Protonotaria citrea*), Seaside Sparrow (*Ammodramus maritimus*), Brown-Headed Nuthatch (*Sitta pusilla*), American Woodcock, Northern Bobwhite, Common Ground-Dove (*Columbina passerina*), Yellow-Throated Warbler (*Dendroica dominica*), Rusty Blackbird (*Euphagus carolinus*), Black Skimmer (*Rynchops niger*), Least Tern (*Sterna antillarum*), Common Tern (*Sterna hirundo*), Gull-billed Tern (*Sterna nilotica*), Black Rail (*Laterallus jamaicensis*), Peregrine Falcon (*Falco*

peregrinus), Bald Eagle (*Haliaeetus leucocephalus*), American Oystercatcher (*Haematopus palliatus*), Red-Throated Loon (*Gavia stellata*), and most migrating and wintering shorebirds and rails, Brant (*Branta bernicla*), American Black Duck (*Anas rubripes*), Lesser Scaup (*Aythya affinis*), Greater Scaup (*Aythya marila*), Tundra Swan (*Cygnus columbianus*), and Wood Duck (*Aix sponsa*).

Description of Habitats

Birds are grouped into 8 priority species-habitat suites for the SAMBI area:

- 1) Grasslands and Associated Habitats
- 2) Managed and Palustrine Emergent Wetlands and Mudflats
- 3) Early-Successional and Shrub-Scrub
- 4) Forested Wetlands
 - Alluvial
 - Pocosins, Carolina Bays, Other Non-Alluvial
- 5) Maritime Communities
 - Maritime Forest / Shrub-scrub
 - Estuarine Emergent Wetlands
 - Beaches and Dunes
 - Open Ocean
- 6) Southern Pine Forests
 - Longleaf / Slash Flatwoods and Savannas and Longleaf Sandhills
 - Mature Loblolly
 - Short-Rotation “Plantation” Pine
- 7) Oak-Hickory / Tulip Poplar / Pine Forests
- 8) Riparian / Mixed Mesic Hardwoods

For each habitat type, this plan provides the following background discussion:

1) Grasslands and Associated Habitats

Historical grass-dominated ecosystems of the Southeastern coastal plain, east of the tallgrass prairies of Texas and Oklahoma and the coastal prairies of Texas and Louisiana, consisted mostly of relatively small and isolated patches within a forest-dominated landscape, including pitcher plant (*Sarracenia* spp.) bogs, prairies, sedgelands, barrens and glades, savannas, and the Everglades. Despite the loss of native grass-dominated ecosystems over the last two centuries, remnant southeastern grasslands remain centers of biological diversity, with many southeastern endemic species totally dependent upon these ecosystems (DeSelm and Murdock 1993). The uniqueness of grasslands and prairies warrants their restoration and management. Their

conservation value is further enhanced because they harbor several federally listed grassland birds.

Also of importance to bird conservation within the region are the longleaf and slash pine savannas formerly found throughout the lower coastal plain and the dry and wet prairies of southern Georgia and northern Florida. Focus here is placed on the grassland component of both sparsely forested savannas and treeless prairies within the coastal plain.

Elsewhere within the coastal plain, the proliferation of pastureland, airfields (both commercial and military), and other "artificially" created grasslands has provided additional grassland bird habitat, offsetting the loss of some historical grasslands. While remnant native grasslands still support the core habitats for more highly vulnerable species (e.g., Henslow's Sparrow, Florida Sandhill Crane), many species also benefit from cropland management and pasturelands. However, even common grassland species such as Eastern Meadowlark (*Sturnella magna*) and Savannah Sparrow (*Passerculus sandwichensis*) are showing strong declining trends due to changes in pasture grasslands (from warm-season to cool-season grasses) and more efficient mowing practices. Priority species associated with these habitats are Henslow's Sparrow, Bachman's Sparrow, Florida Sandhill Crane, Northern Bobwhite, American Woodcock, Loggerhead Shrike, and Barn Owl, Eastern Kingbird (*Tyrannus tyrannus*), and Grasshopper Sparrow (*Ammodramus savannarum*).

2) Managed and Palustrine Emergent Wetlands and Mudflats

One of the most important habitat types within this category are the freshwater marshes, tidal flats, and emergent tidal marshes. Freshwater marshes are important for supporting significant populations of rails, many species of which are increasingly considered vulnerable (Eddleman et al. 1988). Most recently, apparent declines in the continental population of King Rail (*Rallus elegans*) has brought considerable attention to the importance of freshwater marsh ecosystems to this species, as well as other freshwater marsh species such as Yellow Rail (*Coturnicops novaboracensis*), Black Rail (*Laterallus jamaicensis*), Least Bittern (*Ixobrychus exilis*), and American Bittern (*Botaurus lentiginosus*). Other intertidal mudflats, dredge spoil areas, and managed impoundments are extremely important for shorebirds, waterbirds, and waterfowl on a seasonal basis. There are approximately 40,500ha of existing managed impoundments from southeast North Carolina to north Florida, and these coastal wetlands provide some of the most significant wetland habitats for waterfowl (Gordon et al. 1998), shorebirds (Weber and Haig 1996), and waterbirds (Bildstein et al. 1990). Some of the highest priority species associated with these habitats are Wood Stork, White Ibis, Little Blue Heron (*Egretta caerulea*), Gull-billed Tern (*Sterna nilotica*), Limpkin (*Aramus guarauna*), Stilt Sandpiper (*Calidris himantopus*), Whimbrel (*Numenius phaeopus*), Blue-winged Teal (*Anas discors*), and Northern Pintail (*Anas acuta*).

3) Early Successional and Shrub/Scrub

Early-successional shrub-scrub habitats originate and are maintained by natural disturbance phenomena including grazing by hoofed animals, tornadoes, hurricanes, ice storms, and most notably fire. Elimination of these phenomena has led to the loss of most shrub-scrub habitats, as well as the longleaf pine forests from the Southeast. Historically, the most stable shrub-scrub habitats in the Southeast were those areas subjected to frequent and large-scale disturbance

regimes such as fire. Among the most important habitats is the shrub-scrub habitat characterized by fire-prone vegetation under mature southern pine forests, including longleaf pine-southern scrub oak, wiregrass (*Aristida spp.*), bluestem (*Andropogon spp.*), saw palmetto (*Serenoa repens*), cutthroat grass (*Panicum abscissum*), ferns, gallberry (*Ilex glabra*), as well as pitcher plant bogs and remnant cedar glades. The trend away from large clearcuts on both public land and non-industrial private lands in the South, the trend away from inefficient farming, and still too few efforts to restore natural ecosystem functions in those biotic communities requiring regular disturbance all point to loss of birds dependent on shrub-scrub habitats.

Species of highest concern in these habitats are Bachman's Sparrow, Henslow's Sparrow, Loggerhead Shrike, Prairie Warbler (*Dendroica discolor*), Painted Bunting, Field Sparrow (*Spizella pusilla*), American Woodcock, and Northern Bobwhite.

4) Forested Wetlands (Alluvial and Non-alluvial)

a. Alluvial

Bottomland hardwood forests, alluvial forests, and swamp forests are among those biotic communities in the Southeast adapted to flooded conditions. Various combinations of oaks, especially overcup oak (*Quercus lyrata*), swamp chestnut oak, water oak (*Quercus nigra*), cherrybark oak, willow oak (*Quercus phellos*), Shumard oak (*Quercus shumardii*), water tupelo (gum), swamp tupelo, and baldcypress usually dominate the canopy of mature forests. Cottonwoods (*Populus spp.*), willows (*Salix spp.*), river birch (*Betula nigra*), and elms (*Ulmus spp.*) dominate disturbed sites.

Major recognized wetland forest types within southeastern floodplains are: (1) cottonwood, (2) black willow (*Salix nigra*), (3) overcup oak/water hickory (*Q. lyrata/Carya aquatica*), (4) sweetgum/willow oak (*Liquidambar styraciflua/Q. phellos*), (5) sugarberry/American elm/green ash (*Celtis laevigata/Ulmus alata/Fraxinus pennsylvanica*), (6) eastern sycamore/sweetgum/American elm (*Platanus occidentalis/L. styraciflua/U. alata*), (7) willow oak/water oak/laurel oak, (8) swamp chestnut oak/cherrybark oak, (9) baldcypress, (10) baldcypress/water tupelo, (11) water tupelo/swamp tupelo, and (12) sweetbay/swamp tupelo/red bay (*M. virginiana/N. sylvatica var. biflora/Persea borbonia*) (Sharitz and Mitsch 1993).

There has been extensive drainage and conversion of forested wetlands throughout the Southeast, from over 18 million ha before the mid-1800's to just over 12 million ha in 1985, an overall decline of about 30% (Hefner et al. 1995). Furthermore, Koneff and Royle (2004) calculated a net loss of palustrine forested wetlands in the SAMBI area of approximately 720,500ha from the 1970's through the 1990's. Almost all of the remaining 70% of forested wetland in the Southeast has been cutover at least once and frequently fragmented in the process. This fragmentation has been associated with greater losses of forest-interior and area-sensitive species (e.g., the recently "rediscovered" Ivory-billed Woodpecker in Arkansas and the "presumed extinct" Bachman's Warbler) due to the almost complete elimination of large tracts of mature forest age-classes.

Outside the Mississippi Alluvial Plain, the largest remaining "relatively intact" forested wetland systems are all within the SAMBI area. Protection of existing floodplain forested wetlands within the Roanoke, Winyah Bay (Pee Dee and Waccamaw), Francis Marion National Forest

(Santee and Cooper), ACE Basin, Savannah, Altamaha, Lower Suwannee, and Apalachicola rivers should be top priority.

Species in need of conservation attention within the SAMBI area in decreasing order of potential vulnerability include Swallow-tailed Kites, coastal populations of Black-throated Green Warblers, Swainson's Warblers, Rusty Blackbird, and Prothonotary Warblers. In addition, local populations of Cerulean Warblers and Florida Short-tailed Hawks occur as high priority breeding species in this area. Although Yellow-throated Warbler is not as high a priority species, it still warrants attention due to unclear population trends and association with very large and tall trees (fast disappearing from the coastal plain). Other species of importance here are American Woodcock, Louisiana Waterthrush (*Seiurus motacilla*), and Limpkin.

b. Pocosins, Carolina Bays, Other Non-Alluvial

Pocosins are made up of shrub-scrub ("low"), often dominated by pond pine, and forested ("high") dominated by bays, associated wetlands, and associated uplands (from canebreaks to Atlantic white-cedar). These areas are unique to the Southeast and are restricted mainly to Virginia and North Carolina (except for smaller areas in the Winyah Bay area of South Carolina). Seventy percent of an estimated 1.4 million ha of potential pocosin habitat is located in North Carolina (Richardson and Gibbons 1993). However, less than one third of the original area can now be considered intact, with about another one third irrevocably altered (Richardson and Gibbons 1993). In coastal North Carolina, nearly all of the forested wetlands, much of which were pocosin, were converted to non-wetlands uses (e.g., conversion to pine plantations; Hefner et al. 1995). Today, major timber companies own over 40% of pocosin habitats in North Carolina (Sharitz and Gibbons 1982). More dramatically, both canebrake and Atlantic white cedar (the two successional extremes within pocosin situations) have been reduced to one percent of their original pre-settlement occurrence (Frost 1995). Fire suppression led to the decline of canebreak and pond pine, while Atlantic-white cedar, occurring in pocosin areas with low fire frequency (usually over 100 years between fires), was converted for agriculture and timber production.

Carolina Bays are elliptical depressions which occur in a broad band across the SAMBI area. These depressions are remarkably consistent in shape and degree of compass orientation (NW to SE), and are dominated by evergreen shrubs and bay trees. Some bays are less than 50m (162ft) in length, while some approach 8km (5mi) long. Prior to European colonization, there were probably 10,000-20,000 Carolina bays, mainly found in South Carolina. Presently, few Carolina bays can be considered untouched by deleterious human activities. Both pocosins and Carolina bays have been converted to farmlands, pine (principally) or hardwood monocultures, or lost to peat mining. In addition, areas around Carolina bays are highly susceptible to commercial and residential development (Richardson and Gibbons 1993). Black-throated Green Warblers, Swainson's Warblers, Prothonotary Warblers, and Worm-eating Warblers (*Helmitheros vermivorus*) are among the species requiring attention in non-alluvial wetlands. In addition, Ovenbird (*Seiurus aurocapilla*), American Redstart (*Setophaga ruticilla*), and Black-and-white Warbler (*Mniotilla varia*) are locally important in pocosins and Carolina Bays. All of these species, except Prothonotary Warbler, are apparently isolated from Appalachian population centers. In pond pine dominated pocosins, a number of pine specialists may be supported, including Red-cockaded Woodpecker (*Picoides borealis*), Brown-headed Nuthatch, Red-headed Woodpecker (*Melanerpes erythrocephalus*), and Chuck-will's-widow (*Caprimulgus carolinensis*). Interestingly, pocosins subject to frequent fire is one of the few habitat types that

legitimately support both priority pine specialists (associated with the open pine canopy) and otherwise forested wetland specialists (associated with cane and/or dense shrub layer).

5) Maritime Communities (shrub/scrub and mature forest, estuarine emergent wetlands, beaches and dunes, open ocean)

a. Shrub-Scrub/Mature Forest

Maritime woodlands are found on the leeward side of shrub-scrub thickets or on the bay side of islands. Maritime woodlands are relatively tolerant of salt spray, bright sunlight, wind shear, drought conditions, and nutrient-poor soils. Most sites are dominated by oaks, pines, red bay, and numerous understory shrubs and are referred to as coastal hammocks or temperate broad-leaved evergreen forests, and are considered a part of southern mixed hardwood or temperate hardwood forest types (Platt and Schwartz 1990, Ware et al. 1993). Climax maritime woodlands are characterized by live and laurel oaks with sweetbay (*Magnolia virginica*) as a co-dominant. The presence and dominance of live oaks are indicative of the most advanced successional stage among maritime woodlands. These advanced woodlands are today largely restricted to the Atlantic Coast, especially on the Sea Islands. Alternatively, the presence and dominance of laurel oak, young loblolly, or slash pine is indicative of younger successional stands. Successional scrub-shrub on old stable dunes are frequently dominated by saw palmetto (North Florida Atlantic), yaupon holly (*Ilex vomitoria*), and wax myrtle (*Myrica cerifera*) growing in dense thickets.

Historical maritime communities, comprising about 648,000ha in the Southeast, have undergone dramatic changes since European/African colonization. Native Americans influenced the condition of maritime communities, but the permanent settlements and commerce centers of colonization changed the nature of human interaction in these areas. Today, the extent and rate of recovery of maritime communities from natural disturbances is dependent upon human history (both Native and European/African) as well as dredge and fill beach/dune operations and development pressure.

As of the mid-1970's, less than 10% of maritime landcover was in forest (most remnants now in Sea Islands, N. Florida Atlantic, and Central Gulf). Wetlands made up over 50% of landcover, with smaller percentages in dunes and beaches, rangeland, agriculture, and urban areas. Although loss of coastal wetlands has slowed since the 1970's, development of coastal areas continues, to the detriment of upland maritime woodlands, dunes, and beaches (Culliton et al. 1990, Moore et al. 1993). Development is most obvious along the Florida Atlantic Barrier Islands (over 50% of present lands use) and least obvious among the Sea Islands (less than 10%). Almost all maritime woodlands that have not been removed completely have been altered.

Maritime forest and scrub-shrub habitat is perhaps most important for neotropical migratory landbirds moving to and from their Caribbean and Latin American wintering grounds. However, unpredictable factors (i.e., weather) have made it difficult to quantify the importance of specific areas at any one time. Thus, conservation must be measured in terms of decades with the assumption that all forest patches are potentially important, until better techniques provide resolution of concentration sites.

The highest priority species associated with these habitats are eastern Painted Bunting, Prairie Warbler, Common Ground-Dove, Northern Parula (*Parula americana*), Yellow-throated

Warbler, and many transients including Bicknell's Thrush (*Catharus bicknelli*), Kirtland's Warbler (*Dendroica kirtlandii*), Cape May Warbler (*Dendroica tigrina*), Black-throated Blue Warbler (*Dendroica caerulescens*), and Connecticut Warbler (*Oporornis agilis*).

Many nearctic-neotropical migratory landbirds orient southeastward during autumn migration to their tropical (primarily West Indian and South American) wintering areas. The South Atlantic coastline and Peninsular Florida, particularly maritime woodlands, appear to be critically important during this migration. Gulf Coast maritime woodlands are more important than South Atlantic woodlands for most spring migrants, and support large number of autumn migrants as well (Moore and Woodrey 1995).

b. Estuarine Emergent Wetlands

Estuaries, which include tidal flats and emergent wetlands, border maritime woodlands in many areas. Estuaries separate islands from each other or from the mainland and are well known for their importance to commercial fisheries and as environmental filters. In addition, tidal flats are important foraging areas for many migratory and wintering waterbirds, colonial nesting birds, and raptors. Estuarine emergent vegetation provides cover and foraging for a large number of both nesting and wintering species in the SAMBI area.

The most important species associated with these habitats are Nelson's Sharp-tailed Sparrow (*Ammodramus nelsoni*), Saltmarsh Sharp-tailed Sparrow, Seaside Sparrow complex (*Ammodramus maritimus*), Black Rail, Yellow Rail, Wood Stork, and Sedge Wren (*Cistothorus platensis*).

c. Beaches and Dunes

Beaches and overwash areas provide important foraging habitat for migratory and wintering shorebirds, resident colonial nesting water birds, and migratory raptors. Beaches above the high tide line and dunes provide nesting habitat specifically for several high priority shorebirds. In addition to avian communities, beaches and dunes are important for federally listed plants and animals including seabeach amaranth (*Amaranthus pumilis*), nesting sea turtles, and oldfield mouse (*Peromyscus polionotus*). The popularity of beaches, particularly during the summer, has resulted in numerous conflicts between beach nesting species and humans. As of the mid-1970's, less than 15% of maritime land cover was in beaches and dunes, and coastal development is accelerating in many areas (Culliton et al. 1990, Moore et al. 1993).

Important species here are American Oystercatcher (*Haematopus palliatus*), Wilson's Plover (*Charadrius wilsonia*), Cuban Snowy Plover, Piping Plover, Red Knot, Least Tern (*Sterna antillarum*), Black Skimmer, and Reddish Egret (*Egretta rufescens*).

d. Open Ocean (Gulf Stream)

Waters within or near the Gulf Stream section paralleling the South Atlantic Coastal Plain constitute the open ocean portion of this physiographic area. These open waters are the major feeding grounds for Black-capped Petrels. In addition, many other species of wholly or partially pelagic birds occur in large numbers as transients or non-breeding residents, such as White-tailed Tropicbird (*Phaethon lepturus*) and Audubon's Shearwater (*Puffinus lherminieri*). Imminent

threats at this time appear to be few except for the constant possibility of take from longline fisheries and from oil spills that can result in the death of many pelagic birds. Periodic resurgence of interest in exploration for oil deposits within the outer continental shelf, especially off the North Carolina coast, continues to be cause for concern. Additionally, offshore waters in the Gulf of Mexico that border the planning area are important for Northern Gannet (*Morus bassanus*), Common Loon (*Gavia immer*), and Brown Pelican (*Pelicanus occidentalis*).

This Plan addresses the conservation of pelagic and oceanic seabirds of the Southeast United States Continental Shelf and the waters of the Gulf of Mexico associated with the southeastern coastal plain encompassing much of the Southeast U.S. Continental Shelf (SECS, Pelagic BCR 77) and the near shore waters of the Gulf of Mexico (Pelagic BCR 74) ([Figure 2](#)). The waters addressed in this plan include all coastal offshore waters adjacent to the terrestrial portion of the SAMBI planning area in the Gulf of Mexico and waters of the Atlantic Ocean that extend to and beyond the Gulf Stream where high priority oceanic birds inhabit.

Approximately fifteen species of pelagic seabirds or birds of open water (waterbirds, shorebirds) are considered in this plan ([Table 1](#)). Very little information has been developed relative to goals and objectives for the conservation of pelagic species for pelagic BCRs. However, issues, threats, factors leading to loss of habitat, conservation strategies, inventory and monitoring needs, research needs, and education and outreach needs have been suggested (Kushlan et al. 2002).

Potential threats to both Black-capped and Bermuda Petrels include human encroachment at breeding sites and offshore oil and gas exploration at Gulf Stream foraging sites. A major threat to both petrel species concerns lighted ships and platforms that attract birds at night, leading to collisions with wires or other structures. The documented presence of Bermuda Petrels would seem to require consideration of corrective lighting where conflicts are likely to occur. Increased mercury levels associated with oil spills also poses a potential threat. The Black-capped Petrel seems to be rather exceptional in its high levels of accumulated mercury (Whaling and Lee 1982). The source of mercury appears natural (through food, primarily squid), but effects from an additional increase of mercury through shipping spills or future oil exploration requires investigation.

Other Pelagic Species. -- Other priority species at least for monitoring attention include White-tailed Tropicbirds and Federally threatened Roseate Terns. Caribbean populations of White-tailed Tropicbirds are at least regular in small numbers off the South Atlantic coast and are considered by some authorities as vulnerable where they breed (Lee pers. comm.). Only 7,000 pairs persist within the West Indies (plus another 2,500 pairs in Bermuda). This number is low for seabirds, particularly for a regionally endemic subspecies. This subspecies appears stable at present, but is greatly reduced from former population levels. Caribbean populations of Audubon's Shearwaters appear to be more secure. Roseate Terns breeding from New York northward become highly pelagic offshore of the South Atlantic Coastal Plain when moving to and from the southern Caribbean Sea and northeastern South America.

6) Southern Pine Forests

a. Longleaf/Slash Flatwoods and Savannas, and Longleaf Sandhills

Southern pine forests, with longleaf pine occurring at least as a co-dominant, covered an estimated 37.3 million ha at the time of European settlement (about 30.4 million ha where longleaf was dominant). Forests stretched from southeast Virginia (where now reduced to a few remnant trees) to east Texas, interrupted only by major floodplain forested wetlands and occasional prairies (Frost 1993). Along or near coastlines slight shifts in hydrology and salinity favor slash pine over longleaf in flatwoods and savannas, but for all practical purposes, bird species responding more to age and structural characteristics than dominant pine species (though longleaf is still preferred where site conditions allow). Pre-settlement estimates place longleaf dominated forests at 52% of all uplands and 36% of the entire southeastern landscape. By the 1930's, most of the 37.2 million ha had been cut, with about two thirds regenerated to other pine species or converted to other land uses (Croker 1987, Walker 1991, Frost 1993).

Today, less than 3% of the original longleaf (less than 2% of the southeastern landscape) forests remain. If systems drastically altered by fire suppression are excluded, less than 1% (or 272,970ha) remain (Frost 1993). The conversion of many natural pine and hardwood stands to short-rotation pine plantation (mostly loblolly or slash) during this century has resulted in an almost complete elimination of functioning longleaf pine ecosystems, as well as the breakup of large stands of forested wetlands discussed earlier (Croker 1987, Ware et al. 1993). The loss of longleaf pine ecosystems has led to the rarity and endangerment of at least 70 plant taxa, particularly in the Coastal Plain and Florida peninsula but also in the Southern Piedmont and other physiographic areas in the Southeast (Noss et al. 1995). Among vertebrate animals, the future successful conservation of flatwoods salamander (*Ambystoma cingulatum*), gopher frog (*Rana capito*), eastern indigo snake (*Drymarchon corais couperi*), gopher tortoise (*Gopherus polyphemus*), coastal plain fox squirrel (*Sciurus niger*) populations, and many other species may well depend in part on the restoration of longleaf pine ecosystems and the reinstitution of fire as a management tool.

Unlike other temperate forest ecosystems, the high level of biodiversity found in natural longleaf pine forests is mostly restricted to one structural layer, that is, the condition of the ground layer. Frequent growing-season fires are essential for maintaining the density of bunch grasses (principally wiregrasses in the east and bluestems towards the west), forbs, and vines, while keeping the shrub layer to a minimum over a burning cycle of a few years (Frost 1993). In turn, it is this ground layer composition that supports many of the plant and animal species unique to longleaf pine ecosystems.

Priority species within the southern pine forests include the Red-cockaded Woodpecker, Bachman's Sparrow, Henslow's Sparrow (savannas/flatwoods), Brown-headed Nuthatch, Prairie Warbler (sandhills/scrub oak, GA, NC), southeastern American Kestrel (savannas/sandhills/sand pine-scrub oak), Loggerhead Shrike (savannas), Northern Bobwhite, and Red-headed Woodpecker.

b. Mature Loblolly

Although longleaf pine is ecologically the most important of the southern pines within the coastal plain, other species have replaced the longleaf as more economically important. In the SAMBI area, faster growing slash and loblolly pines are of more economic importance.

Loblolly pine is an excellent natural invader of disturbed sites and today is the most frequent pine found in old field successional stages. Even in areas where longleaf is still a numerically important species, disturbance and fire suppression during the last two centuries have led to an increase of loblolly pine (e.g., most population and area goals in the longleaf discussion take into account the prevalence and use in many areas of loblolly, even for Red-cockaded Woodpeckers). Nevertheless, small patches of mature loblolly pines prior to European settlement may have played important roles for some species and certainly are important today (e.g., Swallow-tailed Kite nest requirements under Forest Wetlands section).

High priority species for this habitat association is the same as for longleaf pine, with the addition of Field Sparrow.

c. Short-Rotation “Plantation” Pine

On private industrial lands in the SAMBI area, short-rotation pine can be important as an early-successional habitat. Short-rotation pine plantations are composed of either slash or loblolly pine. Depending on management emphasis, some “older” short-rotational pine stands may be managed to also support some otherwise hardwood dependent species. Although not as important as regularly burned late successional pine, high densities of clearcuts on private industrial lands likely support many early-successional species (principally Northern Bobwhite, Bachman’s and Field Sparrows, Prairie Warbler, and, in northeastern North Carolina and southeastern Virginia, breeding Henslow’s Sparrows). In addition, edges and riparian streamside management zones may support transients. Pine canopies with a hardwood midstory and understory may provide marginal to suitable habitat for other priority species such as Wood Thrush (*Hylocichla mustelina*) and Hooded Warbler (*Geothlypis nelsoni*).

7) Oak Hickory/Tulip Poplar/Pine Forests

Although some literature suggests that extensive upland hardwood-pine mixed forests existed at least north of the Savannah River within the SAMBI area, it is generally recognized today that upland hardwoods prior to European colonization were restricted to sites where fires were infrequent. Two major types of forests are recognized: (1) turkey oak (*Quercus laevis*) and other scrub oak dominated stands in protected sandhill sites and (2) southern mixed mesic forests generally along protected bluffs and ravines. Turkey/other scrub oak stands do not appear to support any high priority birds within the SAMBI area that are not already dependent on longleaf sandhills and are not discussed further here. Southern mixed mesic forests, though very local, are important centers of regional biodiversity and provide high quality habitats for several priority hardwood species, at least locally. Species of concern in this habitat association include Wood Thrush, Hooded Warbler, and Chuck-will's-widow.

8) Riparian/Mixed Mesic Hardwoods (Southern Mixed, Hammocks)

The term riparian refers to streamside areas. In the present context, riparian habitats include bottomlands and all palustrine wetlands in the coastal plain. However, riparian forests may be dominated by tree and shrub species more typical of uplands throughout southeastern interior physiographic areas and locally in the coastal physiographic areas (forested wetlands in narrow floodplains, loess bluff oak/hickory and mixed mesic hardwoods). In many situations, upland riparian habitats are as important as wetland habitats to both aquatic and terrestrial fauna

associated with streams and rivers, especially in those lands where there is high topographic relief or circumvented soils.

Hammocks are best defined as narrow bands of vegetation confined to slopes between upland sand/clayhill pinelands and bottomlands, with species composition determined by relative moisture retention and fire frequency. Hydric stands are distinguished from other forested wetlands by very intermittent flooding and some fire. High humidity and a consequent low frequency of fire distinguish hydric stands from mesic and xeric hammocks (Vince et al. 1989). Hydric hammocks provide important habitats for many species of wildlife, including Swallow-tailed Kite and black bear (*Ursus americanus*). Located near fire-maintained longleaf pine and xeric scrub ecosystems, xeric hammocks are subject to the highest fire frequency, but retain enough moisture to support stands of sizable oaks and other hardwoods.

Mixed mesic hardwoods collectively are important within the coastal plain from North Carolina to Texas. These forests are referred to or included within southern mixed mesic hardwood forests, southern mixed hardwood forests, southern hardwood forests, temperate hardwood forests, temperate broad-leaved forests and mesic hammocks (Platt and Schwartz 1990, Hamel 1992a, Ware et al. 1993). Mixed mesic forests presently reach their greatest development within the Florida panhandle and adjacent to southwestern Georgia and Peninsular Florida.

In areas draining into the Apalachicola River, mesic hammocks are characterized by the codominance of southern magnolia (*Magnolia grandiflora*) and American beech (*Fagus grandifolia*). These mesic hammocks certainly constitute the most important of southeastern riparian woodlands by supporting a number of locally occurring endemic species, such as Florida yew (*Taxus floridana*) and Florida torreya (*Torreya taxifolia*) along the Apalachicola Bluffs, as well as birds and other animals more characteristic of forested wetlands.

Priority species within riparian/mixed mesic hardwood habitat include Swainson's Warbler, Kentucky Warbler, Acadian Flycatcher, Louisiana Waterthrush, and other transients. In most physiographic areas where the highly vulnerable Cerulean Warbler and the usually rare Swainson's Warbler are found, they are mostly restricted to (and are certainly most common in) riparian habitats within largely forested landscapes. Acadian Flycatcher and Louisiana Waterthrush are always more common and widespread than the two warbler species above, but still consistently become rare away from riparian habitats in most physiographic areas.

V. GOALS AND OBJECTIVES

A. Overall Goals and Objectives

Two general and very high priority habitat goals for the SAMBI Planning area are:

- (1) to provide optimal breeding habitat to maintain and increase populations of priority species, and to
- (2) to provide high quality managed habitat to support requirements of species migrating through or spending the winter in the region

These goals are common to all of the major bird conservation plans that are being addressed in this Implementation Plan, and are therefore appropriate to present here as goals for “all bird” conservation. Primary goals for all species associated with this effort can be found at links to the other major bird conservation plans at [NABCI](#).

B. SAMBI Plan Goals

1. Identify priority species and their associated habitats.
2. Delineate focus areas for each of the major bird groups using existing and emerging bird initiatives, and local knowledge.
3. Develop population objectives for priority species (where applicable) and/or develop habitat objectives for helping to meet the population and conservation needs of the region. These objectives can be quantitative or directional.
4. Develop partnerships and implementation strategies to meet stated population and/or habitat objectives.
5. Establish effective and cost-efficient evaluation and monitoring protocols to measure the success in accomplishing population and/or habitat objectives and assist in the adaptive management process.
6. Develop research projects and survey methods to address assumptions underlying population and habitat objectives.
7. Identify habitats and assign priority to areas where this Initiative would be most effective and positive in delivering conservation, while not duplicating other efforts.
8. Provide estimates as to what habitats presently exists (where and how much), identify quantity of habitat and/or numbers of birds/populations desired and the restoration/management objectives necessary to reach that goal.
9. Utilize existing GIS and other current mapping capabilities to recommend and wisely direct conservation efforts in the SACP, in conjunction with planning efforts in the East Gulf Coastal Plain, and with other BCR/JV planning efforts.

C. Regional Population and Habitat Goals

1. Population Goals

Overall Objective:

Maintain, stabilize, or increase populations of high priority breeding, transient, and wintering species.

Goals:

Shorebirds:

- Presently, maintain breeding populations and ensure high reproductive success to ensure sustainable populations of each of the highest priority species in the region.
- During the next 50 years double the breeding population size for each of the highest priority species in the region and/or through population viability analyses, determine population levels needed to ensure long-term viability.

- The objectives would be to maintain enough high quality habitat to support a present breeding population of 900 pairs of American Oystercatchers, 45 pairs of Snowy Plovers, 850 pairs of Wilson's Plovers and 55 pairs of Piping Plovers, and to attempt to at least double this number during the next 50 years.

For more detailed information on national and regional shorebird conservation, please visit: [National Shorebird Plan](#), [Southeastern Coastal Plain-Caribbean Region Report](#), respectively.

Landbirds:

-Stabilize or increase populations of high priority breeding, transient, and wintering bird species.

For extensive detailed information on national and regional landbird conservation, please visit: [North American Landbird Conservation Plan](#), [South Atlantic Coastal Plain](#), respectively.

Waterbirds:

-Recover declining and otherwise vulnerable high priority species and subspecies (especially listed taxa) to healthy population levels region-wide.

-Maintain healthy populations of other species, again by identifying population and habitat objectives.

-Manage depredation issues, including the establishment of maximum acceptable population reduction objectives if justified.

The following quantitative objectives are for the entire portion of BCR 27, which includes the East Gulf Coastal Plain, but are broken out by region and state in many instances. Quantitative objectives for states presented here ([Southeast U.S. Waterbird Conservation Plan](#)), Hunter et al. 2006)) may differ from objectives determined by State Working Groups.

Whooping Crane

Support at least 65 non-breeding individuals and prepare for at least 100 non-breeding individuals, primarily in BCR 31, Peninsular Florida, but also BCR 27 (Southeastern Coastal Plain), and during migration also BCR 28 (Appalachians) and BCR 29 (Piedmont)

Sandhill Crane

Support 425 pairs in the South Atlantic subBCR (Okefenokee Swamp in GA)
(160 pairs based on mid-1980s estimates)

Black Rail

Support 15,000 pairs in the Southeastern Coastal Plain (~7,000 pairs today)

King Rail

Support 6,000 pairs in the Southeastern Coastal Plain (~830 pairs today)

Yellow Rail (non-breeding populations)

Support high survival of almost all individuals remaining for this species, with global population estimate based on BBS of about 215,000 individuals, occurring each year in the Southeast U.S.

~20 percent in the Southeastern Coastal Plain

American Bittern (non-breeding populations)

Support high survival of about a third of all individuals, with global population estimate based on BBS of about 830,000 individuals, either migrating through or otherwise occurring each year in the Southeast U.S.

BCR Objectives: Support (regardless of actual population sizes) the following percentages of non-breeding individuals:

~30 percent Southeastern Coastal Plain

Least Bittern

~Increase from 50,000 to 100,000 pairs to 90,000 to 200,000 pairs category.

BCR Objectives: Support long term average of 150,000 pairs (~70,000 pairs today)
6,000 pairs in the Southeastern Coastal Plain (~1,500 pairs today)

Purple Gallinule

~Increase from 5,000 to 10,000 pairs to 9,000 to 20,000 pairs category.

BCR Objectives: Support long term average of 15,000 pairs (~8,000 pairs today)
1,500 pairs in the Southeastern Coastal Plain (~850 pairs today)

Limpkin

~Increase from 4,000 to 6,000 pairs to 9,000 to 20,000 pairs category.

BCR Objectives: Support long term average of 15,000 pairs (a minimum of 5,000 pairs today)

~3,000 pairs in the Southeastern Coastal Plain (1,000 pairs today)

American Coot

~Increase from 9,000 to 20,000 pairs to 10,000 to 50,000 pairs category (these numbers may need to be revised downward when co-occurring non-breeding populations can be surveyed separate from breeding populations).

2,500 pairs in the Southeastern Coastal Plain (~850 pairs today)

Pied-billed Grebe

~Increase from 10,000 to 50,000 pairs to 40,000 to 60,000 pairs category (these numbers may need to be revised downward when co-occurring non-breeding populations can be surveyed separate from breeding populations).

BCR Objectives: Support long term average of 50,000 pairs (~23,000 today)

~10,000 pairs in the Southeastern Coastal Plain, Appalachians, and Piedmont combined (~2,300 pairs today)

Clapper Rail

~Increase from 10,000 to 50,000 pairs to 40,000 to 60,000 pairs category.

BCR Objectives: Support long term average of 50,000 pairs (~37,000 pairs today)

~25,000 pairs in the Southeastern Coastal Plain (~18,000 pairs today)

Little Blue Heron

~9,000 pairs in the Southeastern Coastal Plain (SACP: ~1,350 pairs today in North Carolina, ~2,000 in South Carolina, ~1,000 in Georgia, ~1,000 in Florida; EGCP: ~1,500 in Alabama, ~600 in Mississippi,

Wood Stork

Support a long-term average of ~2,000 pairs in Florida's portion of the Southeastern Coastal Plain (as high as 1,500 pairs today),

Support a long-term average of ~2,000 pairs in Georgia's portion of the Southeastern Coastal Plain (<1,500 pairs today),

Support a long-term average of ~1,000 pairs in South Carolina's portion of the Southeastern Coastal Plain (<1,000 pairs today).

White Ibis

Support a long-term average of 75,000 pairs in Southeastern Coastal Plain (~17,000 pairs today in NC, ~16,000 pairs today in SC, ~10,000 pairs in GA, ~10,000 pairs in FL, ~1,000 pairs in AL),

Tricolored Heron

In the SAMBI area for Tricolored Heron, support a long-term average of 7,500 pairs (<5,000 pairs today) as follows:

- (a) Support a long-term average of 1,500 pairs (~1,000 pairs today) in NC,
- (b) Support a long-term average of 3,000 pairs (~2,000 pairs today) in SC,
- (c) Support a long-term average of 2,000 pairs (500-1000 pairs today) in GA,
- (d) Support a long-term average of 1,000 pairs (<1,000 pairs today) in FL.

Double-crested Cormorant

Maintain no more than 4,000 pairs in SAMBI area (FL, GA, SC, NC, VA; ~400, 50, 900, 500, and 200 pairs today respectively)

Anhinga

Maintain between 10,000 and 50,000 pairs of Anhingas in the Southeast U.S. (~10,000 pairs today in region) with the following distribution:

44 percent in SAMBI area (AL, FL, GA, SC, NC; ~100, 1,000, 1,000, 2,000, and 400 pairs today respectively),

Cattle Egret

Reduce and maintain no more than 30,000 pairs (~60,000 pairs today) in the Southeastern Coastal Plain

Gull-billed tern

Support a long-term average of ~850 pairs in Southeastern Coastal Plain (~250 pairs today in NC, ~300 pairs in SC, ~50 pairs in GA, <50 pairs in FL, ~75 pairs in AL)

Least tern

Reverse declines and support a long-term average of ~15,000 pairs in the Southeastern Coastal Plain (~1,700 pairs today in NC, ~1,200 pairs in SC, ~750 pairs in GA, ~4,000 pairs in FL, ~500 pairs in AL, and ~2,000 pairs in MS),

Black skimmer

Reverse declines and support a long-term average of 7,500 pairs in the Southeastern Coastal Plain (~600 pairs today in NC, ~600 pairs in SC, ~300 pairs in GA, ~800 pairs in FL, ~250 pairs in AL, and ~300 pairs in MS),

Common tern

Reverse declines and support a long-term average of 2,000 pairs in the South Atlantic Coastal Plain (~1,000 pairs today in NC, ~10 pairs in SC),

Forster's tern

Support a long-term average of 2,000 pairs in the SAMBI area (~1,000 pairs today in NC),

Royal tern

Support a long-term average of 40,000 pairs in the Southeastern Coastal Plain (~11,000 pairs today in NC, ~5,500 pairs in SC, ~8,000 pairs in GA, ~2,500 pairs in FL, ~2,500 pairs in AL, and ~100 pairs in MS),

Sandwich tern

Support a long-term average of 10,000 pairs in the Southeastern Coastal Plain (~2,500 pairs today in NC, ~1,500 pairs in SC, ~700 pairs in GA, ~150 pairs in AL, and ~1,000 pairs in MS),

Laughing Gull

Support a long-term average of 25,000 pairs in the Southeastern Coastal Plain (~32,000 pairs today in NC, ~7,500 pairs in SC, ~800 in GA, ~1,000 in FL, and ~5,000 pairs in AL),

Objective: Reduce Herring Gull numbers and maintain no more than 750 pairs (~1000 pairs today in NC).

Objective: Reduce Great Black-backed Gull numbers and maintain no more than 75 pairs (~200 pairs today in NC).

Pelagic:

- Foraging gadfly (*Pterodroma*) petrels and other seabirds should be protected from contaminants (e.g., mercury and oil spills from ships, potential from future off-shore exploration drilling), longline fisheries (where known concentrations overlap heavily fished areas), and from collisions with night lights.

- In addition, work should begin on a range-wide conservation strategy for both gadfly petrels, Audubon's Shearwaters, and other South Atlantic Seabirds.

- Increase surveys in both pelagic BCRs to determine species and numbers and to fine tune distribution, especially where heavy ship traffic or potential for future oil exploration occurs.

For more detailed information on national and regional waterbird conservation, please visit: [North American Waterbird Conservation Plan](#), and [Southeast U.S. Waterbird Conservation Plan](#), respectively.

Waterfowl:

- Recover declining species by enhancement of breeding grounds.
- Maintain or manage existing healthy populations through knowledge of current population and habitat status and objective population status.
- Continue to revise population reduction objectives that concern the managed harvest of waterfowl, while maintaining that harvest of waterfowl can be desirable and consistent with conservation.
- Maintain or restore traditional distributions of waterfowl in North America, consistent with long-standing patterns of waterfowl utilization.

- The following are directional objectives for ducks that have stated NAWMP continental objectives.

Species	Population Objective
American Black Duck	Increase
Green-winged Teal	Maintain
American Wigeon	Increase
Canvasback	Increase
Gadwall	Increase
Mallard	Increase
Northern Pintail	Increase
Northern Shoveler	Increase/Maintain
Redhead	Increase

Table 3. Directional Objectives for Ducks in the SAMBI Planning Area.

For additional information on national and regional waterfowl conservation, please visit: [North American Waterfowl Management Plan](#), and [Atlantic Coast Joint Venture Waterfowl Implementation Plan](#), respectively.

Northern Bobwhite-Early Successional-Grassland Bird Species:

- The following populations objectives (Coveys) for Northern Bobwhite are taken directly from the Northern Bobwhite Conservation Initiative. Population goals (coveys) are provided for each state for the SAMBI Planning Region.

Convert to Native Warm Season Grass

Site Prep, Burn, Thin

State	Pop. Goal Coveys	CRP Grass		Improveable Ag Land		CRP Pines		Southern Pines	
		Acres	Coveys	Acres ¹	Coveys	Acres	Coveys	Acres	Coveys
FL	44,688	5.1	1,275	120,024	30,006	114.8	345	4,354.3	13,062

GA	180,469	18.0	4,500	613,960	153,490	482.3	1,446	7,010.9	21,033
NC	105,703	4.8	1,200	378,364	94,591	13.0	39	3,291.2	9,873
SC	70,469	37.7	9,425	213,000	53,250	152.0	456	2,445.7	7,338
VA	15,469	8.5	2,125	47,292	11,823	8.2	24	499.1	1,497
Total	346,798	74.1	18,525	1,372,640	343,160	1534.3	2,310	17,601.2	52,803

Table 4. Population goals (coveys to be added) and recommended management practices (acres x 1,000) by land use type for 10 states comprising BCR 27 (NBCI 2002).

For additional information on please visit: [Northern Bobwhite Conservation Initiative](#).

2. Habitat Goals

Overall Objectives:

- Provide adequate high quality habitats for high priority breeding, transient, and wintering species.
 - o Increase the number of acres/hectares of managed wetlands for shorebirds and waterbirds, particularly for shorebirds during fall migration.
 - o Increase quality and availability of stop-over habitat for transient landbird species.
 - o Protect remaining forested wetlands.
 - o Restore and manage longleaf pine forests.
 - o Protect shoreline, beaches, and dunes.
 - o Restore and protect estuaries.
 - o Protect remaining maritime forests.

Goals:

Shorebirds:

-Provide optimal breeding habitat to maintain and increase priority species in the planning region. The goal for breeding habitat is to provide sufficient habitat to maintain and increase priority species in the planning region. The objectives would be to maintain enough high quality habitat to support a present breeding population of 900 pairs of American Oystercatchers, 45 pairs of Snowy Plovers, 850 pairs of Wilson's Plovers and 55 pairs of Piping Plovers, and to attempt to at least double this number during the next 50 years.

-Provide high quality managed habitat to support successful migration through and over-wintering within the planning region, particularly during fall migration.

-Maintain disturbance frequencies at breeding, foraging and roost sites below that which would be expected to exceed tolerance levels for successful reproduction or for maintaining fat stores needed for long-distance migration.

-Maintain washovers, sandflats, and mudflats, especially on barrier islands created by hurricanes; that is, do not immediately attempt "repairs" to hurricane created habitat.

For more detailed information on national and regional shorebird conservation, please visit: [National Shorebird Plan](#), [Southeastern Coastal Plain-Caribbean Region Report](#), respectively.

Landbirds:

- Retain and restore approximately 526,000ha of native warm season grass habitats.
- Provide at least 121,400ha of five year idle lands, 121,400ha of annuals, and 242,800ha of ten-twenty year idle lands.
- Maintain and improve the habitat quality of eight forested wetland sites for Swallow-tailed Kite, maintain and stabilize at least one forested wetland site for Cerulean Warbler, at least ten sites for Wayne's Black Throated Green Warbler, and thirty sites for Swainson's Warbler, which requires ten patches over 40,407ha, fifteen patches over 8,094ha, 7 patches over 4,407ha, and 30 patches over 2,428ha.
- Protect 100 % of remaining maritime communities and increase acreage wherever restoration is possible.
- Increase long leaf pine forest acreage form 607,050ha to over 890,340ha and improve conditions favoring warm season grassy ground cover, on at least 263,055ha by year 2025.
- Increase the quality and availability of stopover habitat for transient species.

For extensive detailed information on national and regional landbird conservation, please visit: [North American Landbird Conservation Plan](#), [South Atlantic Coastal Plain](#), respectively.

Waterbirds:

- Protect existing acreage from extensive disturbance, predators, contaminants, and conflicts with fishing gear.
- Identify emergent wetlands that are most important for waterbirds and work to provide permanent protection.
- Identify the best candidate sites for restoration and restore emergent wetlands that have been degraded, altered, or converted to non-wetland uses.
- Control exotic and invasive species, such as Phragmites.
- Controlled burning can be an important management tool, but careful consideration must be given to timing (avoiding breeding season and other important use periods), extent of the tract to be burned, species present, and desired result.

Habitat Objectives for Emergent Wetlands (Restoration):

30,000 acres in South Atlantic Coastal Plain (SAMBI) as follows:

10,000 acres in North Carolina
10,000 acres in South Carolina
5,000 acres in Georgia
5,000 acres in Florida

Pelagic Habitat and Species

The pelagic regions off the Atlantic Coast (Pelagic BCR 77) and the Gulf of Mexico (Pelagic BCR 74) of the southeastern United States provide critical habitat for many waterbird species. These offshore waters support non-breeding and transient pelagic seabirds, loons, gannets, and several tern species.

Seabirds are widely distributed throughout the offshore waters of the Southeastern United States and Gulf of Mexico with few areas where significant concentrations occur. The most significant congregating site is located approximately 70-75 km ENE of Cape Hatteras, NC, in a region from 50 to 500 fathoms on the outer Continental Shelf (Lee and Soccia 1989, Lee 1995). The area, locally known as “The Point,” is where the Labrador Current and Gulf Stream meet forming a rich and productive foraging area that has the greatest diversity of pelagic seabirds in the western North Atlantic (Lee 1986). The area supports significant numbers or is one of the few known non-breeding congregating sites for Black-capped Petrel, Bermuda Petrel, Audubon’s Shearwater, Greater Shearwater, Sooty Shearwater, White-tailed Tropicbird, Red-billed Tropicbird, Masked Booby, and Bridled Tern (Lee and Soccia 1989, Lee 1995).

Pelagic seabirds tend to congregate in great numbers off the North Carolina coast, but this should not be interpreted to mean that this is the only pelagic region important for seabirds. These birds are generally widely scattered throughout the offshore waters, but tend to congregate in areas with large *Sargassum* mats (Haney 1985). The entire South Atlantic Bight and offshore Gulf of Mexico should be considered important for conservation planning purposes as seabirds are exposed to similar threats throughout the region. Threats to waterbirds in offshore waters include oil spill and discharge, collisions with lighted structures, interactions with fishing gear and discarded line, discarded plastics or other debris, *Sargassum* harvest, and any other factors that threaten *Sargassum*. Potential threats include competition for fisheries resources and exposure to mercury levels in prey.

Conservation strategies for pelagic seabirds and other waterbird species in offshore ocean and Gulf waters should consist primarily of preventative measures to reduce or eliminate the likelihood of interactions with fishing gear and line, oil spills or discharge, oil and natural gas extraction structures, and discarded plastics, along with the protection of *Sargassum* ‘reefs.’ Additional information is needed on the impact of commercial harvest of prey species; *Sargassum* harvest, and bycatch of seabirds in commercial fishing operations.

Recommendations:

- Assess impact of seabird bycatch in commercial fishing operations and commercial harvest and bycatch of important prey species.
- Protect *Sargassum* from harvest or other threats.

- Review all proposals and assess impacts locating new oil/natural gas extraction structures on seabirds in offshore waters of the southeastern U.S.
- Include protection of waterbird habitats in all rapid response plans for oil spills.
- Establish a network of volunteers and professionals to identify and respond to seabird die-offs, and develop a reporting/data collection mechanism to record and track such die offs.
- Protect pelagic habitats through policy development with the various Fisheries Management Councils and Commissions operating on the Atlantic Seaboard.
- Identify and protect roosting and loafing areas during the non-nesting season.
- Identify pelagic focus areas where seabirds congregate seasonally.
- Reduce, minimize, or eliminate conflicts with pollution, fisheries, and oil and hazardous materials in pelagic foraging habitats.
- Minimize harvest or overharvest of sargassum (prey-base habitat) and menhaden populations (prey-base).

For more detailed information on national and regional waterbird conservation, please visit: [North American Waterbird Conservation Plan](#), and [Southeast U.S. Waterbird Conservation Plan](#), respectively.

Waterfowl:

- Continue to manage breeding and foraging sites for the long-term success of the 11 stable populations of waterfowl.
- The following habitat goals (acres) for waterfowl presented here are for waterfowl focus areas for states within the ACJV (Waterfowl Implementation Plan, Revision March 2005). Generally, these waterfowl focus areas fall within the geographical boundary of the SAMBI area, and therefore, can be used as habitat objectives for waterfowl in the SAMBI planning region and for each state (see [State Goals and Objectives](#) section below and ([Figure 20](#)). However, some boundaries of these waterfowl focus areas do fall outside of the SAMBI planning region, indicating waterfowl objectives may or may not adjusted for a particular focus area.

State	Focus Area	Protect		Enhance		Restore		Total	
		Hectare	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres
Georgia	Coastal							40,696	100,562
	Savannah River							51,050	126,146
	Oconee/Ocmulgee/								
	Altamaha							54,129	133,756
	Chattahoochee/Flint								
	Rivers							49,011	121,109

State	Focus Area	Protect		Enhance		Restore		Total	
		Hectare	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres
	Dougherty Plains							4,728	11,682
	Carolina Bays							16,005	39,548
	Ogeechee River							3,358	8,298
	Okefenokee Basin							3,804	9,401
<hr/>									
Florida								0	0
	Gulf Coast							0	0
	Tallahassee Area Lakes							0	0
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North Carolina									
	Roanoke / Chowan Rivers	4,047	10,000	81	200	202	500	4,330	10,700
	Northern Albemarle	405	1,000	81	200	81	200	567	1,400
	Currituck Sound / North River	1,214	3,000	202	500	202	500	1,618	4,000
	Albemarle / Pamlico Peninsula	2,023	5,000	809	2,000	1,012	2,500	3,844	9,500
	Southern Outer Banks	40	100	405	1,000	40	100	485	1,200
	Neuse / Pamlico Rivers	4,047	10,000	1,012	2,500	1,619	4,000	6,678	16,500
	New River	202	500	81	200	40	100	323	800
	Lower Cape Fear River	4,047	10,000	809	2,000	1,214	3,000	6,070	15,000
	Carolina Bays	2,023	5,000	405	1,000	81	200	2,509	6,200
	Waccamaw River	405	1,000	81	200	81	200	567	1,400
	Lumber River	809	2,000	202	500	405	1,000	1,416	3,500
	Upper Neuse River	202	500	81	200	81	200	364	900
	Outside of Focus Areas	809	2,000	81	200	81	200	971	2,400
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South Carolina									
	ACE	8,094	20,000	4,047	10,000			12,141	30,000
	Santee River	8,094	20,000	6,677	16,500			14,771	36,500
	CAWS	4,047	10,000					4,047	10,000
	South Lowcountry	8,094	20,000	4,047	10,000			12,141	30,000
	Santee Lakes	8,782	21,700	6,880	17,000			15,662	38,700
	Winyah	34,398	85,000	607	1,500			35,005	86,500
	Great-Pee Dee -Lynch's	4,047	10,000					4,047	10,000
	Little Pee Dee/Lumber	12,141	30,000					12,141	30,000
	Upper Waccamaw	6,070	15,000					6,070	15,000
	Cowasee Basin	2,023	5,000	607	1,500			2,630	6,500
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Virginia									
	Southeast Virginia	12,180	30,097	2,436	6,019	1,218	3,010	15,834	39,126

Table 5. Habitat Objectives for Waterfowl Focus Areas in SAMBI.

For additional information on national and regional waterfowl conservation, please visit: [North American Waterfowl Management Plan](#), and [Atlantic Coast Joint Venture Waterfowl Implementation Plan](#), respectively.

Northern Bobwhite-Early Successional-Grassland Bird Species:

-The following objectives for Northern Bobwhite are taken directly from the Northern Bobwhite Conservation Initiative. Habitat goals (acres) are provided for each state for the SAMBI Planning Region.

- 1) Increase the amount and enhance the quality of the agricultural lands for nesting, brood-rearing, and roosting by bobwhites and other grassland species of wildlife by adding native warm season grasses and other conservation plantings such as shrubs and forbs.
- 2) Enhance the management practices on pinelands and mixed pine-hardwoods by thinning, controlled burning, and site preparation in a fashion that benefits bobwhites and other wildlife, and increase acreage devoted to longleaf pine where it is ecologically feasible.
- 3) Preserve and enhance the quality of rangelands by utilizing vegetation management practices and grazing regimes that favor the retention and improvement of native plant communities beneficial to bobwhites and other wildlife.

Convert to Native Warm Season Grass

Site Prep, Burn, Thin

State	Pop. Goal	CRP Grass		Improveable Ag Land		CRP Pines		Southern Pines	
	Coveys	Acres	Coveys	Acres ¹	Coveys	Acres	Coveys	Acres	Coveys
FL	44,688	5.1	1,275	120,024	30,006	114.8	345	4,354.3	13,062
GA	180,469	18.0	4,500	613,960	153,490	482.3	1,446	7,010.9	21,033
NC	105,703	4.8	1,200	378,364	94,591	13.0	39	3,291.2	9,873
SC	70,469	37.7	9,425	213,000	53,250	152.0	456	2,445.7	7,338
VA	15,469	8.5	2,125	47,292	11,823	8.2	24	499.1	1,497
Total	346,798	74.1	18,525	1,372,640	343,160	1534.3	2,310	17,601.2	52,803

Table 4. Population goals (coveys to be added) and recommended management practices (acres x 1,000) by land use type for 10 states comprising BCR 27 (NBCI 2002).

For additional information on Northern Bobwhite conservation, please visit: [Northern Bobwhite Conservation Initiative](#).

D. State Goals and Objectives

Some states in SAMBI have attempted to step down continental and regional population or habitat objectives to state level BCR objectives. Generally, this is difficult to do, yet existing population and habitat objectives for some species allowed for such a step down, particularly where objectives of high priority species functioned to incorporate objectives of other species in similar habitats. Additionally, existing regional objectives for the various bird conservation plans are not entirely explicit about where to place quantifiable habitat conservation objectives, and therefore, State Working Groups were able to evaluate such objectives in their state relative to stated goals and identify where best to target such conservation. One of the best working examples of this step down process is in the [Setting Population and Habitat Objectives](#) section above regarding allocation of eight patches of forested wetland habitat for the conservation of Swallow-tailed Kite, Wayne's Black-throated Green Warbler, and Swainson's Warbler. The results of this process are outlined in the state sections for South Carolina, Georgia, and Florida below. Some states did not feel comfortable with stepping down objectives, and will therefore rely upon objectives outlined in the various national and regional bird conservation plans, from

objectives defined in their State Comprehensive Wildlife Plans, and more general directional objectives. Finally, at least one bird conservation plan, The Northern Bobwhite Conservation Initiative (NBCI), has quantifiable objectives for the restoration of Northern Bobwhite habitat segregated by BCR, State, and habitat type ([Table 4](#)). Population and habitat objectives that have been developed by states are presented below.

State Focus Areas

Each state has developed discreet focus areas for waterfowl, shorebirds, waterbirds, and landbirds. Three states, Georgia, South Carolina, and North Carolina, have developed focus areas for Northern Bobwhite, early successional species and/or other grassland species ([Figure 13](#)). Additionally, Florida has identified two pelagic focus areas ([Figure 10](#)). These focus areas are presented at the end of each of the state sections below. Additionally, states have completed State Wildlife Action Plans which identify specific objectives for high priority species and which have specifically targeted areas for conservation of these high priority species. Finally, some state population objectives have been presented for species in the previous section (Population Goals) for the entire SAMBI region but broken out by state for BCR 27 and will not be presented here again.

1. Virginia

Virginia has not developed or stepped down any national or regional population or habitat objectives at this time specific to SAMBI planning area in Virginia at this time. However, Virginia will rely upon existing objectives outlined in existing bird conservation plans, and objectives defined in their State Wildlife Action Plan. Quantifiable objectives for the restoration of Northern Bobwhite habitat are outlined for Virginia in [Table 4](#). Click here for detailed information on: [Virginia's Comprehensive Wildlife Conservation Strategy](#). Additionally, information regarding avian resources in the SAMBI portion of Virginia can be found in at: [Virginia's Mid-Atlantic Coastal Plain](#) in the “Conservation and Strategies” section for each species.

Some regional population and population habitat objectives for the SAMBI portion of Virginia are presented in the preceding sections for Regional population and habitat objectives.

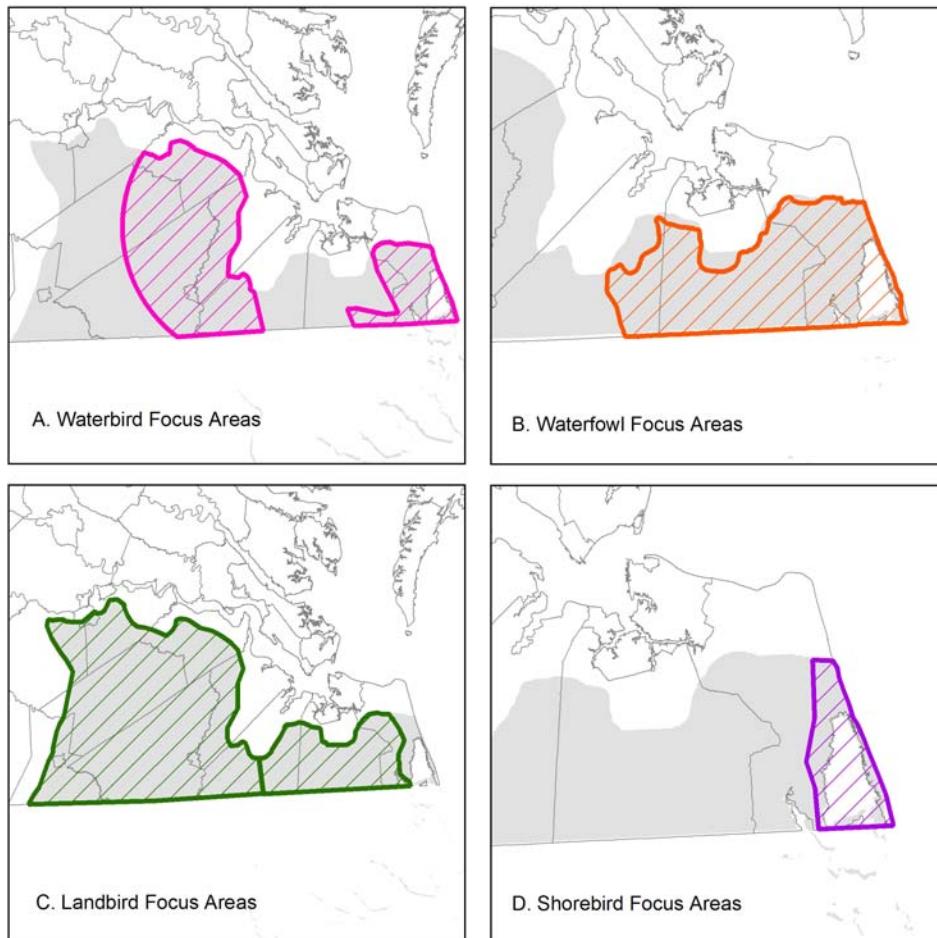


Figure 6. Focus Areas in Virginia. a) waterbird; b) waterfowl; c) landbird; d) shorebird.

2. North Carolina

Waterfowl

- Support a population of 100,000 Tundra Swans
- Support a population of 60,000 Canada Geese (non-residents)
- Maintain current levels of Snow Geese (30,000)
- Breeding objective for American Black Duck is 500 pairs

Waterbirds

The following table was developed for the Roanoke-Tar-Nuese-Cape Fear Ecosystem. The State Working Groups of North Carolina equates this ecosystem with the geographic SAMBI area for North Carolina, therefore, goals are identical.

Colonial Waterbird Goals for Roanoke-Tar-Neuse-Cape Fear Ecosystem

Species	Statewide		SAMBI		State Status
	# Nests	# Sites	# Nests	# Sites	
White Ibis	8000	6	8000	6	W2
Glossy Ibis	500	7	500	7	SC
Brown Pelican	4000	5	4000	5	SC (PD)
Green Heron*					
Black-crowned Night-Heron	250	10	250	10**	
Yellow-crowned Night-Heron*					W2, W3
Great Egret	2500	30	2500	30	
Cattle Egret	No management need; No goal set; State will continue to monitor				
Snowy Egret	800	15	800	15	SC
Tricolored Heron	1500	15	1500	15	SC
Little Blue Heron	1200	15	1200	15	SC
Least Tern	2000	25	2000	25	SR (PSC)
Forster's Tern	1100	15	1100	15	W2
Sooty Tern	NA				
Royal Tern	15000	6	15000	6	
Sandwich Tern	2700	6	2700	6	W2, W5
Caspian Tern	25	1	25	1	SR
Common Tern	2500	20	2500	20	SR, (PSC)
Gull-billed Tern	300	6	300	6	T
Black Skimmer	1000	15	1000	15	
Laughing Gull	No management need, but no < 10000				
Herring Gull	No management need, but no > 1000				
Great Black-backed Gull	No management need, but no > 200				

* = No accurate data on which to base a state or ecosystem goal

** = Coastal or estuarine area (not counting river swamps)

Great Blue Heron, Anhinga, and Double-crested Cormorants numbers and estimates remain unknown and nest primarily inland; goals not established, but need to be.

T = Threatened; SC = Special Concern; SR = Significantly Rare; PD = Proposed De-listed; PSC = Proposed Special Concern; W = Watch List (see NC Natural Heritage Program for numeric code)

Table 6. Colonial Waterbird Goals for Roanoke-Tar-Neuse-Cape Fear Ecosystem

Shorebirds

- Provide 1,539ha of managed wetlands for shorebirds during migration, particularly fall migration when many wetlands have been flooded up for waterfowl food production
- Population objective of 600 pairs of Wilson's Plovers in the next 50 years
- Population objective of 100 pairs of Piping Plovers in the next 50 years
- Population objective of 550 pairs of American Oystercatchers in the next 50 years

Landbirds

- Restore and maintain at least 2,835ha of pocosin/savannah for 5,000 pairs of Henslow's Sparrow
- Provide 127,575ha of warm season grasses for Northern Bobwhite
- Restore 42,930ha of longleaf pine community
- Support and maintain 103,478ha of Red-cockaded Woodpecker (RCW) habitat, while providing habitat for Southeastern American Kestrel, Brown-headed Nuthatch, and Bachman's Sparrow. Focus on Fort Bragg, Camp Lejeune, and the Suffolk Scarp.
- Restore 36,405ha of pond pine pocosin on public lands, to assist in supporting an RCW population of 500 groups
- Restore, enhance, and manage 17,010ha of Atlantic white cedar on National Wildlife Refuges in northeastern North Carolina, mixed with other non-alluvial forested wetlands for Wayne's Black-throated Green Warbler and Swainson's Warbler.
- From the Dismal Swamp to the South Carolina state line, provide seven patches of 40,470ha, four patches of 4,050-8,100ha, and one patch of 2,430-4,050ha of forested wetlands
- Determine importance of maritime forest to transient species and Painted Bunting
- Identify maritime pine savannah sites and restore through prescribed burning to support species associated with longleaf pine ecosystems
- Develop appropriate prescribed burning programs to minimize impacts to Black Rail and Seaside Sparrow
- Develop partnerships with the two Voice of America sites to conserve significant populations of Henslow's Sparrows.

Pelagic

- Work with mineral industry to minimize impact to foraging seabird concentration areas off of Cape Hatteras. Significant numbers of Red-throated Loon, Black-capped Petrel, and Bermuda Petrel utilize these waters.

Additional detailed information on avian resources in the coastal plain of North Carolina can be found at: [North Carolina Wildlife Action Plan](#), and more specifically in Chapter 5, [Species and Habitat Assessments and Conservation Strategies](#).

Some state level population and habitat objectives can be found in the preceding Regional section on population and habitat objectives above.

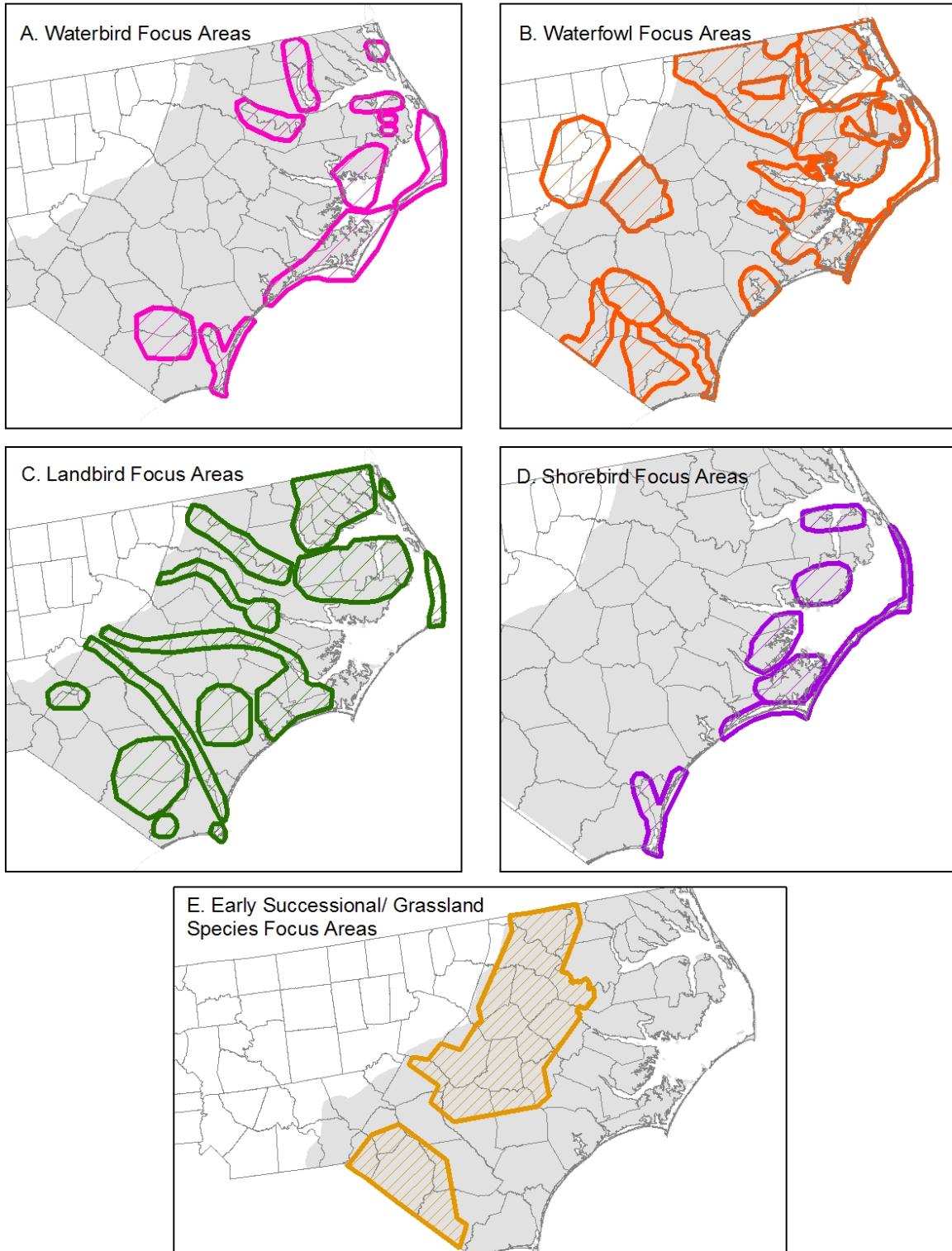


Figure 7. Focus Areas in North Carolina. a) waterbird; b) waterfowl; c) landbird; d) shorebird; e) early successional/grassland species.

3. South Carolina

Waterfowl

Dabbling Ducks- objectives were developed using the Noffsinger method – energetics based calculation, 1.9% wintered in SC in 70's, 324,598 to overwinter, divers-75,000.

- Provide 40,500ha of coastal impoundments or productive habitat, currently 28,350ha, need 12,150 additional ha.
- Provide habitat for 590,000 ducks in SC.
- Provide bottomland hardwood habitat for 240,000 Wood Ducks.

Waterbirds

- Increase acreage of managed wetlands.
- Expand Wood Stork and White Ibis rookeries by protecting bottomland hardwoods and swamps.
- Reduce number of Double-crested Cormorants to 1000 pairs.
- Reduce disturbance to colonies and rookeries.
- Provide usable nesting island every 30 miles, hurricanes can have significant impacts.
- Reduce disturbance by boaters and beach users to nesting areas and islands.
- Royal terns are currently declining, current goal is 18,000 pairs, currently have 3,000 pairs.
- Goal for Sandwich Terns is 5000 pairs.
- Goal for Gull-billed Tern is 500 pairs.

Shorebirds

- High priority species are American Oystercatcher and Wilson's Plover.
- Goal is 500 nesting pairs of American Oystercatcher, at 400 now.
- Reduce disturbance from boat wakes and beach development.
- Objective of 500 pairs of Wilson's Plover.
- Objective of 800 pairs of Black-necked Stilt, up to 500 pairs now.
- Work to encourage Least Terns to nest in natural areas.
- Increase acreage of managed wetlands, and work with landowners to provide suitable habitat during fall migration through the South Carolina Shorebird Habitat Management Group.

Landbirds

- Goal is 300 pairs of Swallow-tailed Kites in the Waccamaw-Pee Dee region, Francis Marion National Forest, and Savannah River corridor, 120-150 pairs currently.
- Protect remaining maritime forest communities for Painted Bunting.
- Follow NBCI objectives to assist in providing habitat for Loggerhead Shrike, Barn Owl, and Painted Bunting, as well as Northern Bobwhite.
- Inventory habitat for Wayne's Black-throated Green Warbler, and protect remaining habitat.

Specifically, for Northern Bobwhite:

- Increase the amount and enhance the quality of the agricultural lands for nesting, brood rearing and roosting by bobwhites and other grassland species by adding native warm season grasses and other conservation plantings such as shrubs and forbs.
- Enhance the management practices on pinelands and mixed pine-hardwoods by thinning, controlled burning and site preparation in a fashion that benefits bobwhites and other wildlife.
- Preserve and enhance the quality of rangelands by utilizing vegetation management practices and grazing regimes that favor the retention and improvement of native plant communities beneficial to bobwhites and other wildlife.

Specifically:

- 1) Convert 911,615 acres (**SC 8,315 acres or 3,365ha**) of cool season grasses currently in the CRP to native warm season grasses/forbs to produce an estimated 227,925 coveys (**SC 2,079**).
- 2) Apply appropriate site preparation techniques, burning and/or thinning to the 1,534,300 acres (**SC 152,000 or 61,514ha**) of pines in CRP trees. This would add about 4,602 coveys (**SC 456**).
- 3) Apply appropriate site preparation techniques, burning and thinning to the 29,613,000 acres (**SC 2,445,700 acres or 989,775ha**) of pinelands. This should add 88,839 coveys (**SC 7,338**).
- 4) Add to the improvable acres of the agricultural land base 2,122,736 acres (**SC 213,000 or 86,201ha**) of native warm season grasses. This can be achieved through replacement of row crop acreage and by conversion of cool season hay and/or pasture. This addition of 18.5ha of native warm season grasses per square mile will change the habitat on 6.5% of the improvable agricultural land base and should add 530,684 coveys (**SC 53,250**).

Some state level population and habitat objectives can be found in the preceding Regional section on population and habitat objectives above.

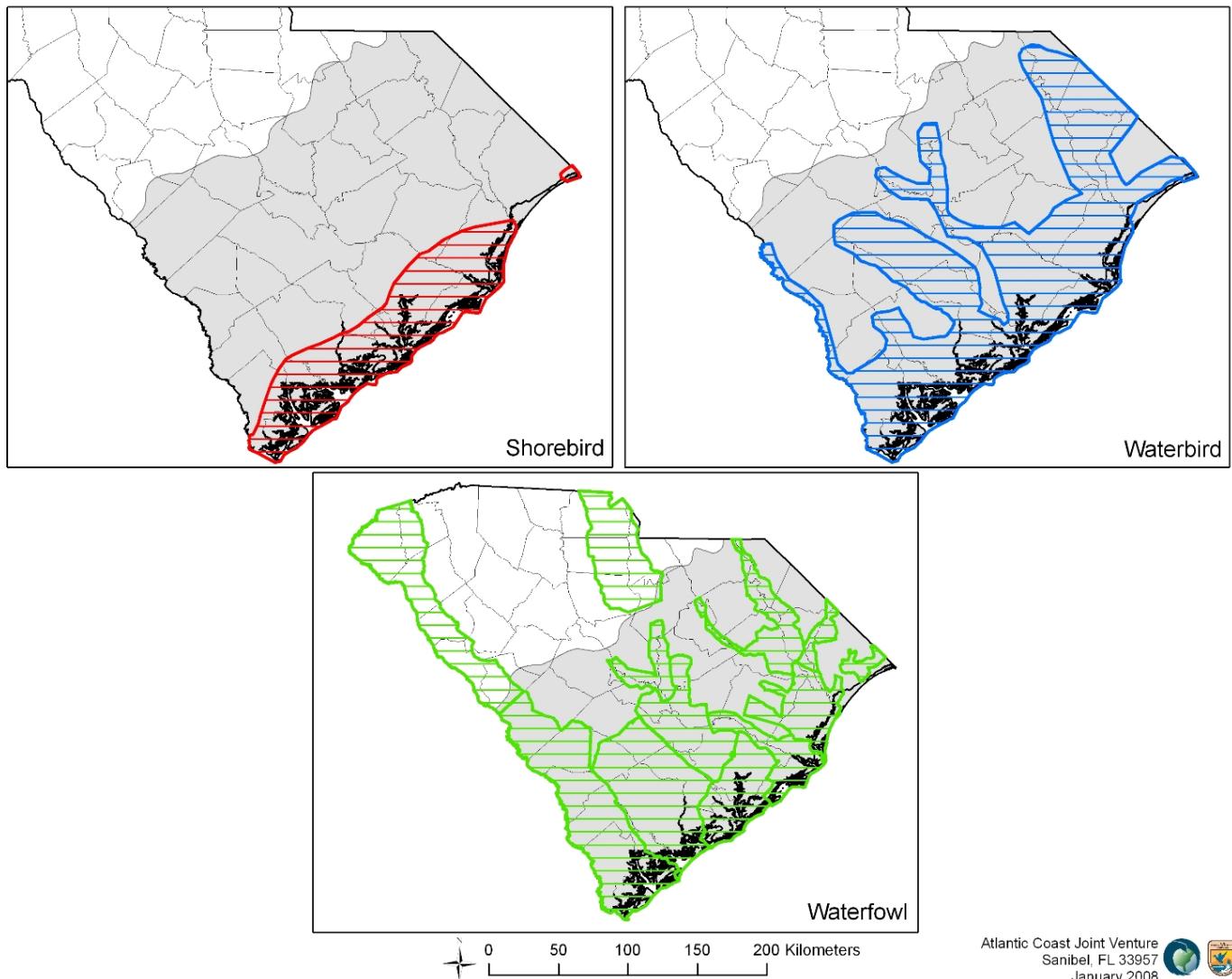


Figure 8a. Shorebird, Waterbird, and Waterfowl Focus Areas in South Carolina

Atlantic Coast Joint Venture
Sanibel, FL 33957
January 2008



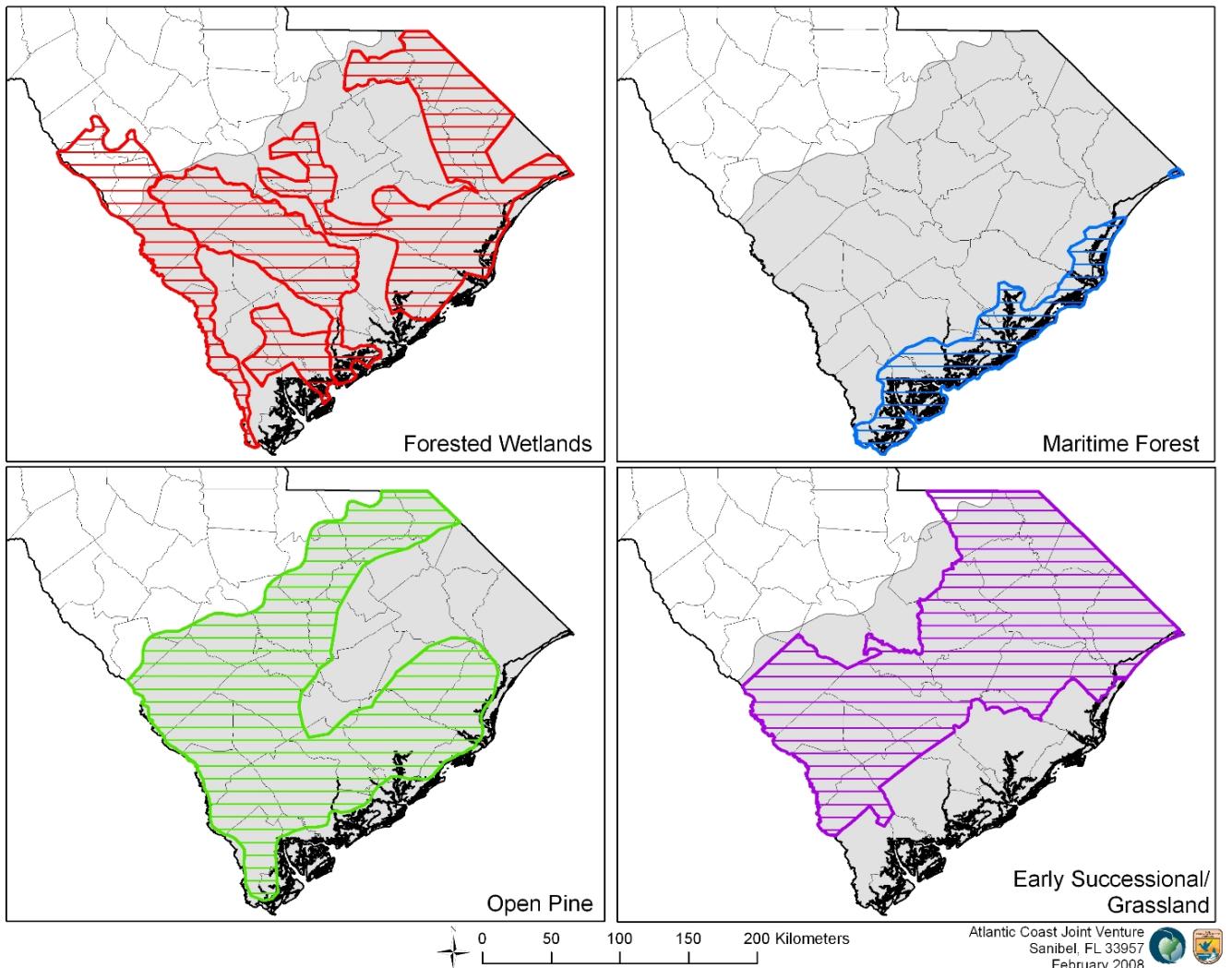


Figure 8b. Landbird Focus Areas in South Carolina

Additional detailed information on avian resources in the coastal plain of South Carolina can be found at: [South Carolina's Comprehensive Wildlife Conservation Strategy](#), and more specifically in Chapters 2 and 4. Conservation actions for avian species and guilds can be found at: [Species](#).

4. Georgia

Waterfowl

See Regional Habitat Objectives above ([Table 5](#)).

Additionally, Georgia has identified the following short-term (5-10 yrs.) for waterfowl focus areas:

Focus Area	<u>Short-Term ACJV Goals (5-10 year period)</u>			
	Forested Wetland	Shrub/Scrub Emergent	Moist Soil Impound	Flooded Crops
Coastal	4,567	913	183	18
Savannah River	5,729	1,146	229	23
Oconee/Ocmulgee/ Altamaha	6,074	1,215	243	24
Chattahoochee/Flint Rivers	5,500	1,100	220	22
Dougherty Plains	531	106	21	2
Carolina Bays	1,796	359	72	7
Ogeechee River	377	75	15	2
Okefenokee Basin	427	85	17	2
Total Habitat Goal in Acres	25000	5000	1000	100

Waterbirds

The following are goals (pairs) for waterbirds in Georgia:

- 2,780 White Ibis
- 2,490 Great Egrets
- 1,793 Tricolored Heron
- 1500 Snowy Egret
- 180 Black-crowned Night-Heron
- 1000 Little Blue Heron
- 160 Great Blue Heron
- 8 Glossy Ibis
- 10,000 Royal Terns
- 500 Black Skimmers
- 300 Gull-billed Terns
- 600 Sandwich Terns
- 800 Least Terns in natural habitats
- 2000 Brown Pelicans
- 1500 Wood Storks

Shorebirds

The following are goals (pairs) for shorebirds in Georgia:

- 150 pairs of American Oystercatchers
- 200 pairs of Wilson's Plovers
- 300 pairs of Black-necked Stilts

- Increase acreage of managed impoundments.
- Maintain sandbar islands.
- Reestablish historical seabird nesting sites.
- Protect tips of barrier islands.
- Restore freshwater wetlands on barrier islands.

Landbirds

The following are goals (pairs) for high priority landbirds in Georgia:

- 300 Swallow-tailed Kites
- 25,000 Swainson's Warblers
- 35,000 Prothonotary Warblers
- 25,000 Bachman's Sparrows

- Protect 121,500ha in three patches of 40,500ha each, primarily for Swallow-tailed Kite in the Savannah River corridor and Altamaha River watershed.
- Protect another 202,500ha in 20 patches for Swainson's and Prothonotary Warbler.

Other

- Acquire lands along the Altamaha River watershed.
- Renovate impoundments in the Altamaha River area.
- Renovate impoundments on Sapelo Island.
- Hydrology restoration on Ossabaw Island.
- See NBCI for Northern Bobwhite objectives.
- Georgia has delineated focus areas for the conservation of Northern Bobwhite and other early successional/grassland bird species

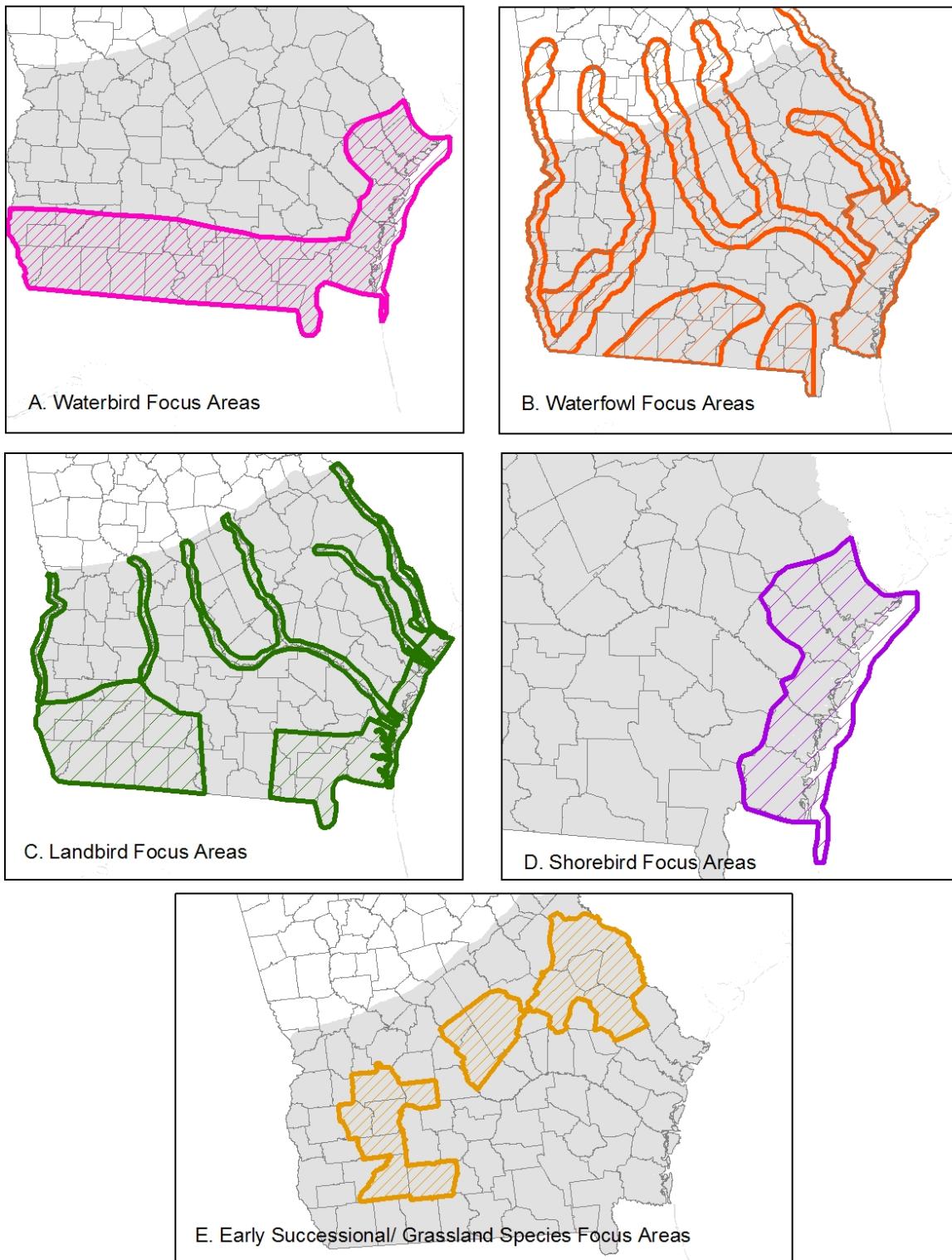


Figure 9. Focus Areas in Georgia. a) waterbird; b) waterfowl; c) landbird; d) shorebird; e) early successional/grassland species.

Some state level population and habitat objectives can be found in the preceding Regional section on population and habitat objectives above.

Additional detailed information on avian resources in the coastal plain of Georgia can be found at: [Georgia's Comprehensive Wildlife Conservation Strategy](#), and [The Southern Coastal Plain of Georgia](#).

5. Florida

Florida has not developed nor stepped down any national or regional population or habitat objectives for SAMBI at this time. However, Florida will utilize existing objectives outlined in existing bird conservation plans, and objectives defined in their State Wildlife Action Plan. Additionally, quantifiable objectives for the restoration of Northern Bobwhite habitat are outlined for Virginia in [Table 4](#). Florida has provided the following information relative to the following bird groups.

Waterbirds

- Protect existing colonies and rookeries
- Protect nesting sites for Black Skimmer, Gull-billed Tern, Royal Tern, and Least Tern.

Shorebirds

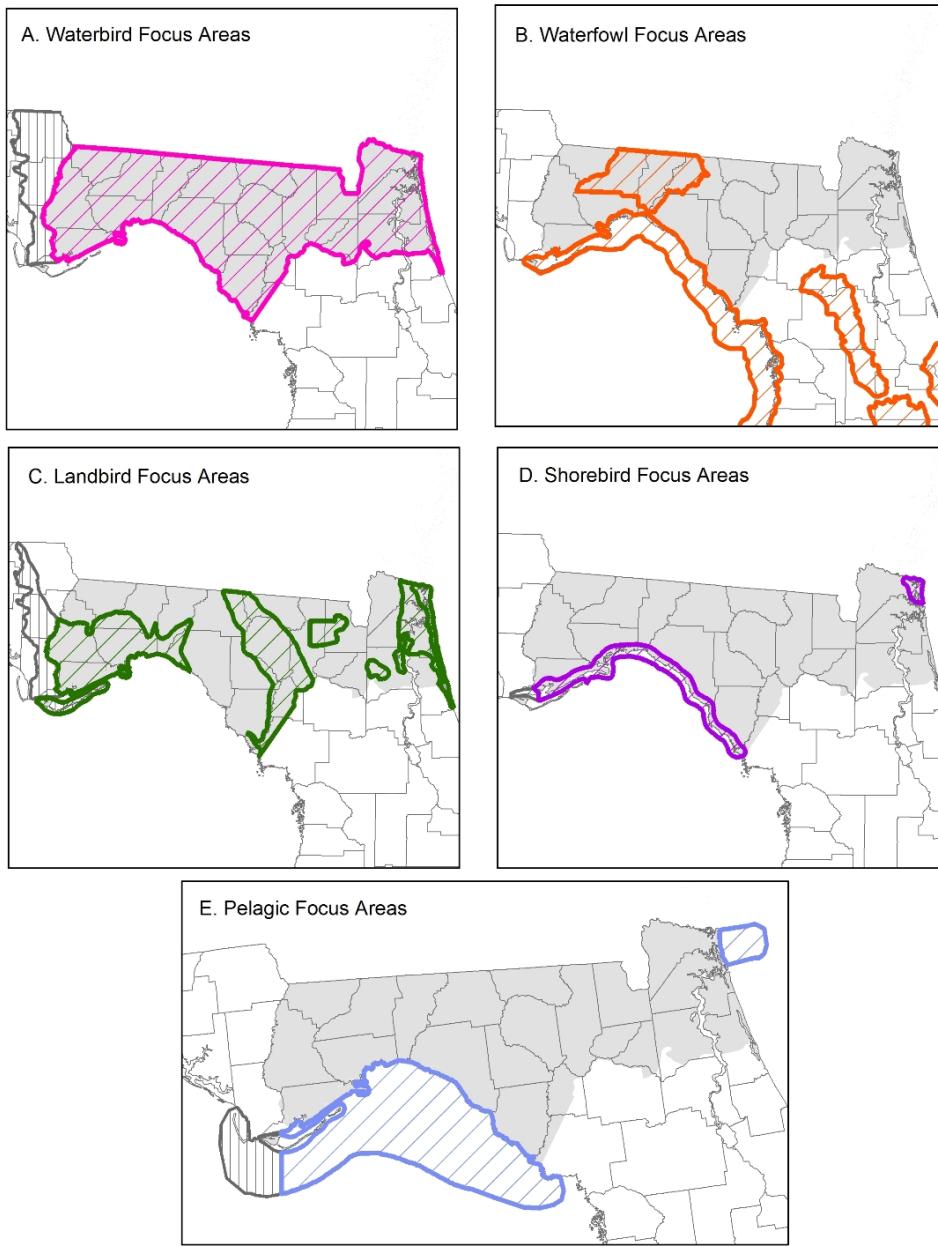
- Protect American Oystercatcher breeding areas and staging areas in northeast Florida and along the barrier islands, and in the central panhandle of the state.
- Protect Snowy Plover areas in the central panhandle.
- Reduce disturbance of wintering shorebirds in all coastal areas.

Landbirds

- Tier to Regional goals.
- Utilize landbird goals developed in the Comprehensive Wildlife Plan.

Pelagic

Florida has identified two pelagic focus areas ([Figure 10](#)). These regions are important to pelagic species in both summer and winter, including Common Loon (*Gavia immer*), Brown Pelican, Double-crested Cormorant, Magnificent Frigatebird (*Fregata magnificens*), Northern Gannet (*Morus bassanus*), Brown Booby (*Sula leucogaster*), Forster's Tern (*Sterna fosteri*), Caspian Tern (*Sterna caspia*), Royal Tern, Sandwich Tern, and Least Tern.



Former part of FL Focus Areas, now in EGCP JV

Figure 10. Focus Areas in Florida. a) waterbird; b) waterfowl; c) landbird; d) shorebird, e) pelagic (shaded areas outside of SAMBI boundary are now in EGCP).

Some state level population and habitat objectives can be found in the preceding Regional section on population and habitat objectives above.

Additional detailed information on avian resources in the coastal plain of Florida can be found at: [Florida's Comprehensive Wildlife Conservation Strategy](#). Here, avian habitat resources are addressed by habitat types and in the conservation action section.

Early Successional/ Grassland Species Focus Areas

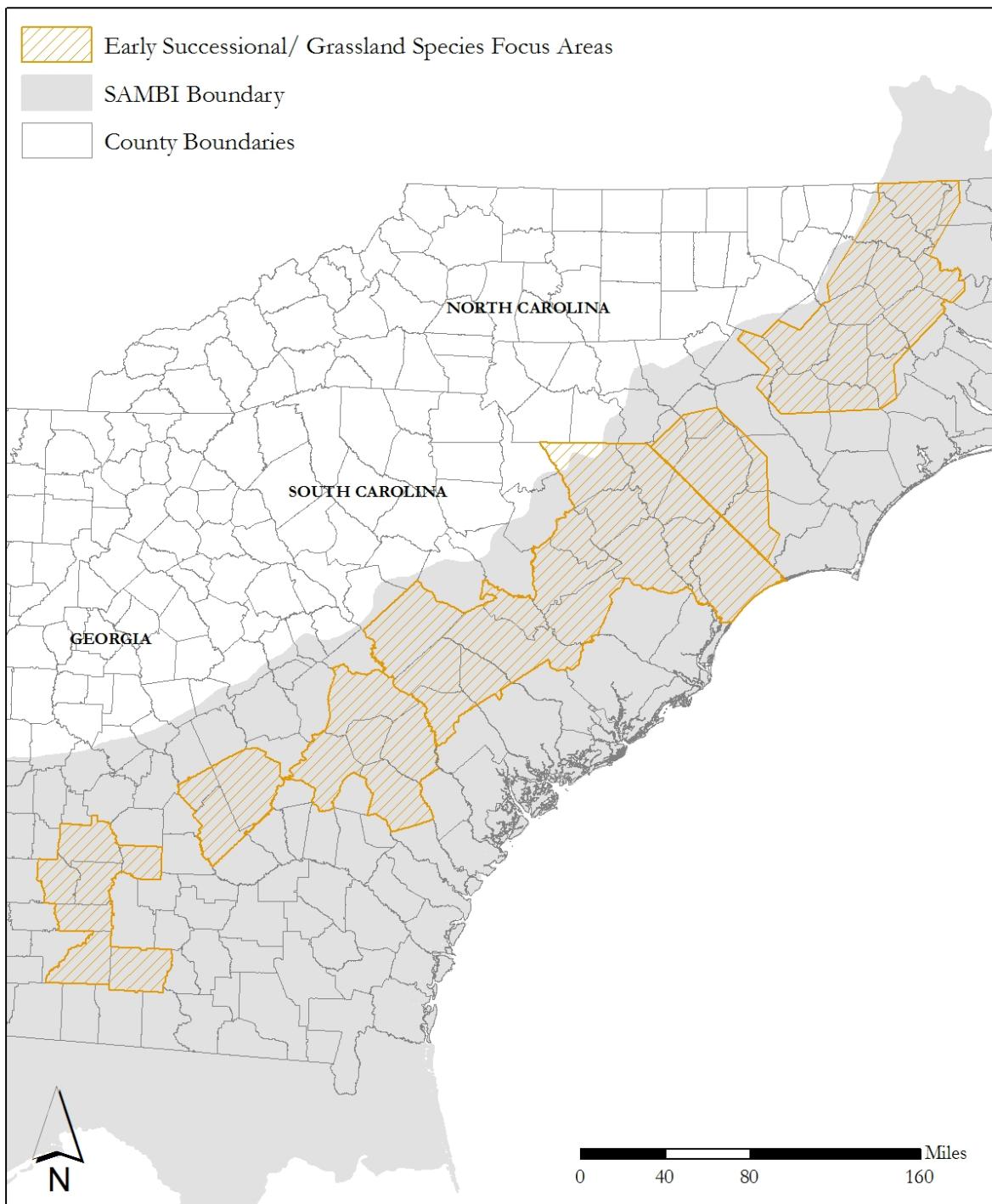


Figure 11. Early Successional/Grassland Species Focus Areas in the SAMBI Planning Region.

VI. STRATEGIES TO ACHIEVE GOALS AND OBJECTIVES

A. Landscape/Regional Conservation

1) Important Bird Areas (IBA's)

The Important Bird Areas (IBA) Program began in Europe in 1985 with Birdlife International. The IBA program has been implemented in the U.S. by two groups, the National Audubon Society and the American Bird Conservancy. The programs differ by organization and within each organization are implemented at the state level. These IBA programs are designed to identify sites of high importance for bird life. This designation places no restrictions on a site and does not entail any regulatory measures it simply recognizes sites of significance.

An Important Bird Area can be defined as a site that has been documented to support significant populations of particular species or a significant diversity of species. Being designated an Important Bird Area usually signifies an area that is managed and maintained for the benefit of ecological health and diversity. Although this is frequently the case, it is not always the standard, birds may frequent places that are not protected or managed for conservation purposes. Often the public confuses the IBA program as being an instrument for choosing good birding sites. The sites are not chosen for their worthiness as public birding places but for their species conservation value, which may result in many places being designated that are not available to the average birder.

It is important to note that the two Important Bird Area programs have the same origin but have developed into separate and unique programs within each agency. The National Audubon Society and the American Bird Conservancy each have distinct qualities they are looking for in a potential IBA site. Within each state, some sites may be on both IBA lists while some states may have radically different IBA site listings.

Within the context of the SAMBI Plan, IBAs can be seen as a useful tool for identifying potential target sites for protection and habitat management. The IBA designation has a certain public value that may aids in the mobilization of resources for the conservation of bird species. It also signifies areas, particularly state or federal lands, where land managers have achieved conservation success. Within the SAMBI planning area boundary there are currently 146 National Audubon Society Important Bird Areas and 31 American Bird Conservancy IBA sites.

Digital coverage of IBA's for each state within the SAMBI Planning area is available.

Table 7. Important Bird Areas of the National Audubon Society and the American Bird Conservancy by State

NAME	NAS	ABC	MAPPED
Virginia			
Great Dismal Swamp NWR	X	X	Y
Piney Grove Preserve	X	X	Y
North Carolina			
Alligator River NWR	X	X	Y
Bald Head/Smith Is.	X		Y

Battery Island	x			
Beacon island	x			
Big Foot Island	x			
Big Swan Island	x			
Caper Hatteras NS	x	x		
Cape Lookout NS	x	x		
Cat Island	x			
Cedar Island Marshes	x			
Chainshot Island	x			
Chowan River Bottomlands	x			
Clam Shoal	x			
Croatan NF	x	x		
DOT Island	x			
Dunahoe Bay	x			
Eagle Island	x			
Ferry Slip Island	x			
Fort Bragg/ Sandhills West		x		
Great Dismal Swamp	x	x		
Great Island	x			
Green Swamp	x			
Gulf Island	x			
Henslow's Fields	x			
Hobucken Marshes	x			
Hog Island	x			
Holly Shelter-Angola Bay	x			
Old House Channel, Island C	x			
Roanoke Sound, Island G	x			
Old House Channel, Island L	x			
Old House Channel, Island MN	x			
Judith Island Point	x			
Lake Mattamuskeet/ Swanquarter NWR	x	x		
Lea-Hutaff Island	x			
Lumber River Bottomlands	x			
Mackay Island NWR	x			
Masonboro Island	x			
Middle Marshes	x			
Monkey Island	x			
Morgan Island	x			
Nags Head Woods	x	x		
Upper Neuse River Bottomlands	x			
Lower Neuse River Bottomlands	x			
New Dump Island	x			
New Stump Point	x			
North Pelican Island	x			
North River Bottomlands	x			
North Rock Island	x			
Old DOT Island	x			
Onslow Bay	x			
Oregon Inlet Shoals	x			

Outer Banks, Inshore Ocean	x			
Outer Continental Shelf, CH	x	x		N
Outer Green Island	x			Y
Palmetto-Pearlree Reserve	x			Y
Pea Island NWR	x	x		Y
Pine Island/Currituck Marshes	x			Y
Pocosin Lakes/Pungo NWR	x	x		Y
Raccoon Island	x			Y
Carrot Island-Bird Shoal	x			Y
Rawls Island	x			Y
Roanoke River Bottomlands	x	x		Y
Roanoke NWR		x		N
Roos Point	x			Y
Sand Bag Island	x			Y
Sandhills East	x			Y
Sandhills West	x			Y
Sheep Island	x			Y
South Pelican Island	x			Y
Striking Island	x			Y
Town Creek Bottomlands	x			Y
Bird Island-Twin Lakes	x			Y
Waccamaw River Bottomlands	x			Y
Wainwright Island	x			Y
West Bank of the Cape Fear	x			Y
Georgia				
Altamaha WMA	x			Y
Altamaha River Delta	x	x		N
Andrews Island	x			N
Augusta Levee	x			N
Big Duke's Pond	x			Y
Big Hammock WMA	x			Y
Blackwater Plantation	x			N
Bond Swamp NWR	x			Y
Bullard Creek WMA	x			Y
Cumberland Island	x	x		Y
Cypress Lake Plantation	x			N
Eufala NWR	x			Y
Fort Benning	x	x		Y
Fort Stewart	x	x		Y
Garden Lakes	x			N
Grand Bay/Banks Lake	x			Y
Harris Neck NWR	x			Y
Jekyll Island	x			Y
Joe Kurz WMA	x			Y
King's Bay Naval Station	x			Y
Lake Seminole WMA	x			Y
Little Tybee Island	x			Y
Okefenokee Swamp	x	x		Y
Ossabaw Island	x			Y

Paradise Public Fishing Area	x			Y
Phinizy Swamp	x			N
Savannah NWR	x			Y
Southlands Forest	x			N
St. Catherine's Island	x			Y
Swamp of TOA	x			N
Wassaw Island NWR	x			Y
Yuchi WMA	x			Y
Florida				
Apalachicola & Tates Hell For.	x	x		Y
Alachua Lakes	x			N
Big Bend Ecosystem	x			Y
Camp Blanding-Jennings	x			Y
Dog Island-Lanark Reef	x	x		N
Duval & Nassau Tidal Marshes	x			N
Fort George and Talbot Islands	x			Y
Greater Apalachicola Bay	x			Y
Guana River	x			Y
Hugenot Park-Nassau Sound	x			Y
Lake Lafayette	x			N
Ichetucknee Springs State Pk.	x			Y
Kanapaha Prairie	x			Y
Lake Disston	x			N
North Atlantic Migrant Stopover	x			N
Osceola NF-Okee. and Pinhook	x	x		Y
Red Hills Ecosystem	x			N
St. Marks NWR	x	x		Y
Wakulla Springs	x			Y
South Carolina				
Brosnan Forest	x			Y
Cape Romain NWR	x	x		Y
Congaree Swamp National Pk.	x	x		Y
Donnelley WMA	x			Y
Francis Beidler Forest	x	x		Y
Francis Marion NF	x	x		Y
Pinckney Island NWR	x			Y
Sandy Island	x			Y
Santee Coastal Reserve/Washo		x		Y
Savannah NWR	x			Y
Sea Pines Forest Preserve	x			Y
Silver Bluff	x			Y
Webb Wildlife Center	x			Y
Westvaco's Central Area	x			N
ACE Basin NWR	x	x		Y
Yawkey Wildlife Center	x	x		Y
Hobcaw Barony	x			Y
Bear Island WMA	x	x		Y
Dungannon Pltn. Heritage Pres.	x			Y
Crab Bank	x			Y

Source: Important Bird Areas listed were gathered from state representatives of Audubon and American Bird Conservancy's IBA programs. Some states had lists available on their websites (American Bird Conservancy: www.abcbirds.org and National Audubon Society: www.Audubon.org). Lists are updated frequently so for complete accuracy please check with the state components of each organization.

Note: Some areas are not mapped due to unavailability of data, and IBA's that fall outside of SAMBI's planning area are not included.

The following maps (Figures 12-16) were created to demonstrate the location of protected lands and IBA sites for each state. Depending upon availability of data, certain sites may not appear on their respective state maps. Accuracy of the protected lands data is variable.

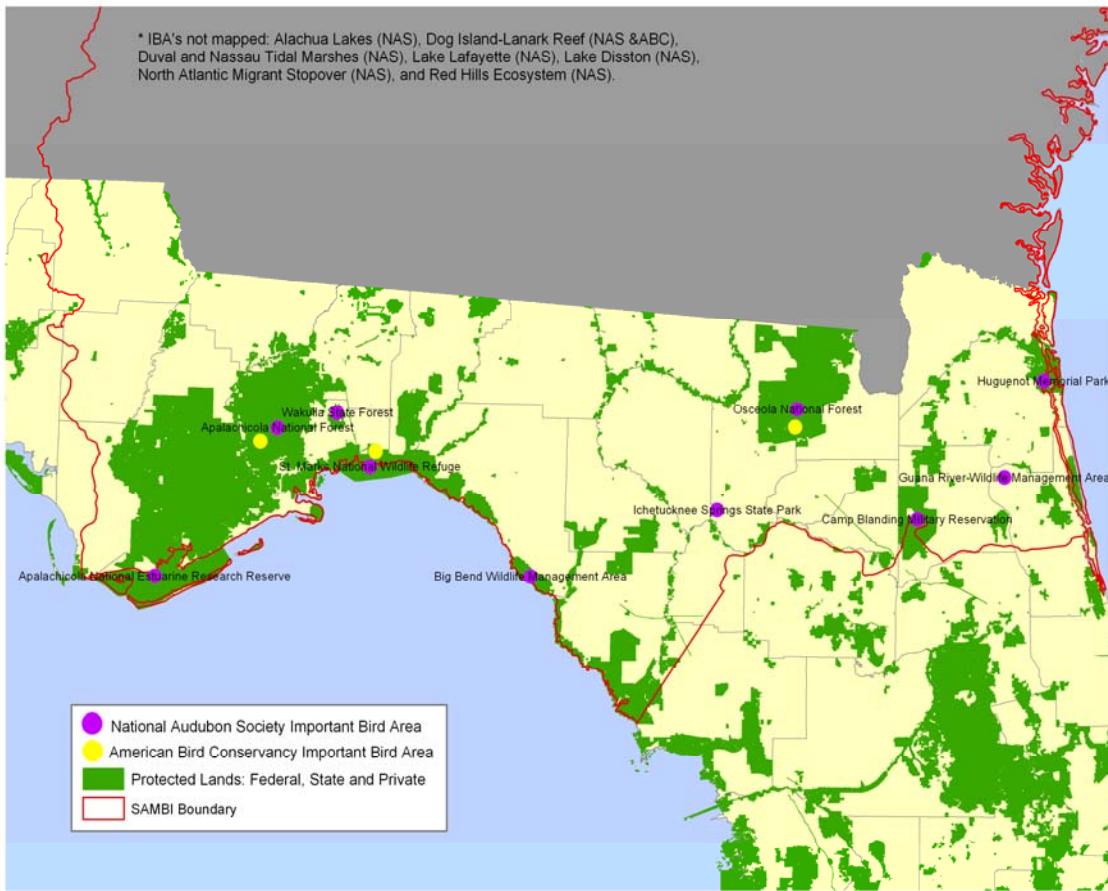


Figure 12. Important Bird Areas of the National Audubon Society (NAS) and the American Bird Conservancy (ABC) within the Florida Planning Region of the SAMBI.

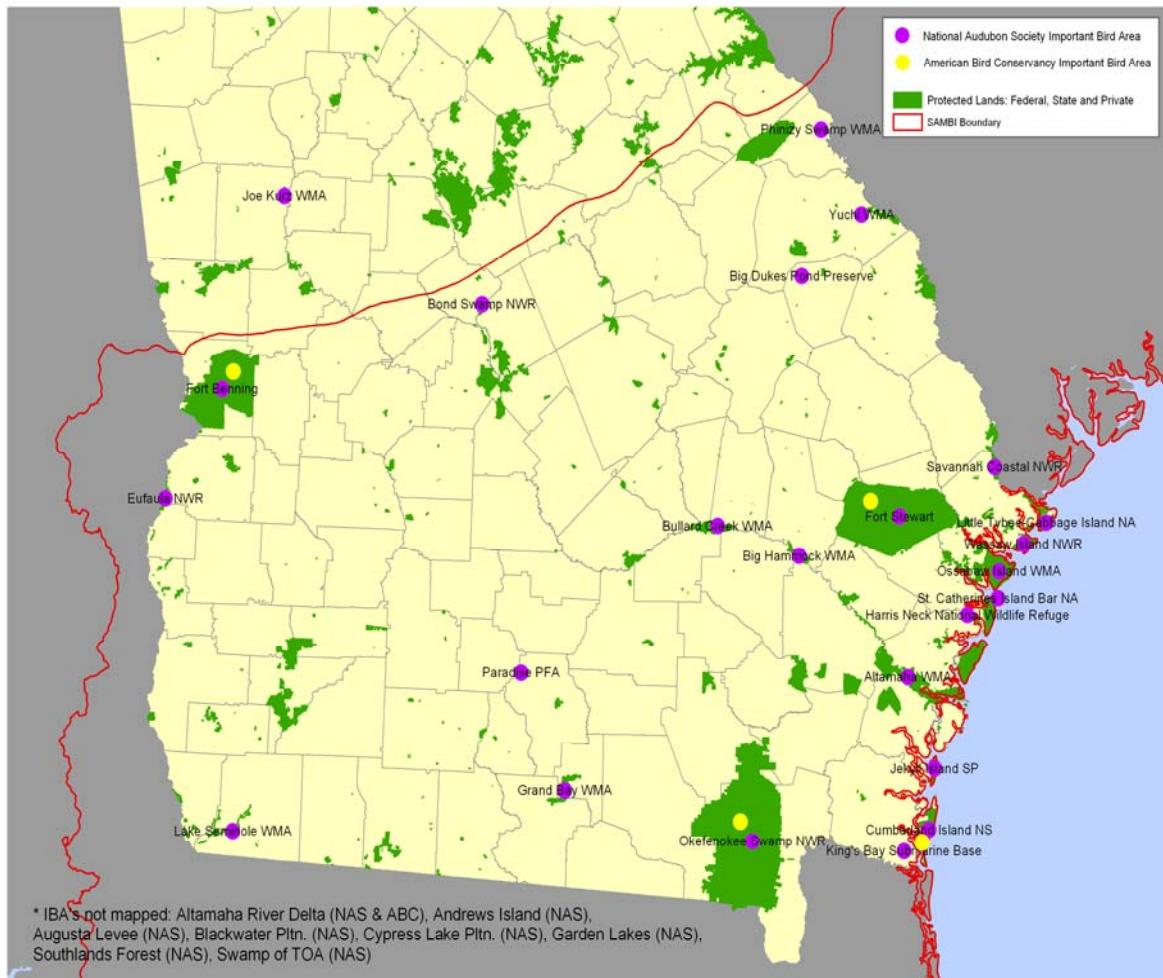


Figure 13. Important Bird Areas of the National Audubon Society (NAS) and the American Bird Conservancy (ABC) within the Georgia Planning Region of the SAMBI.

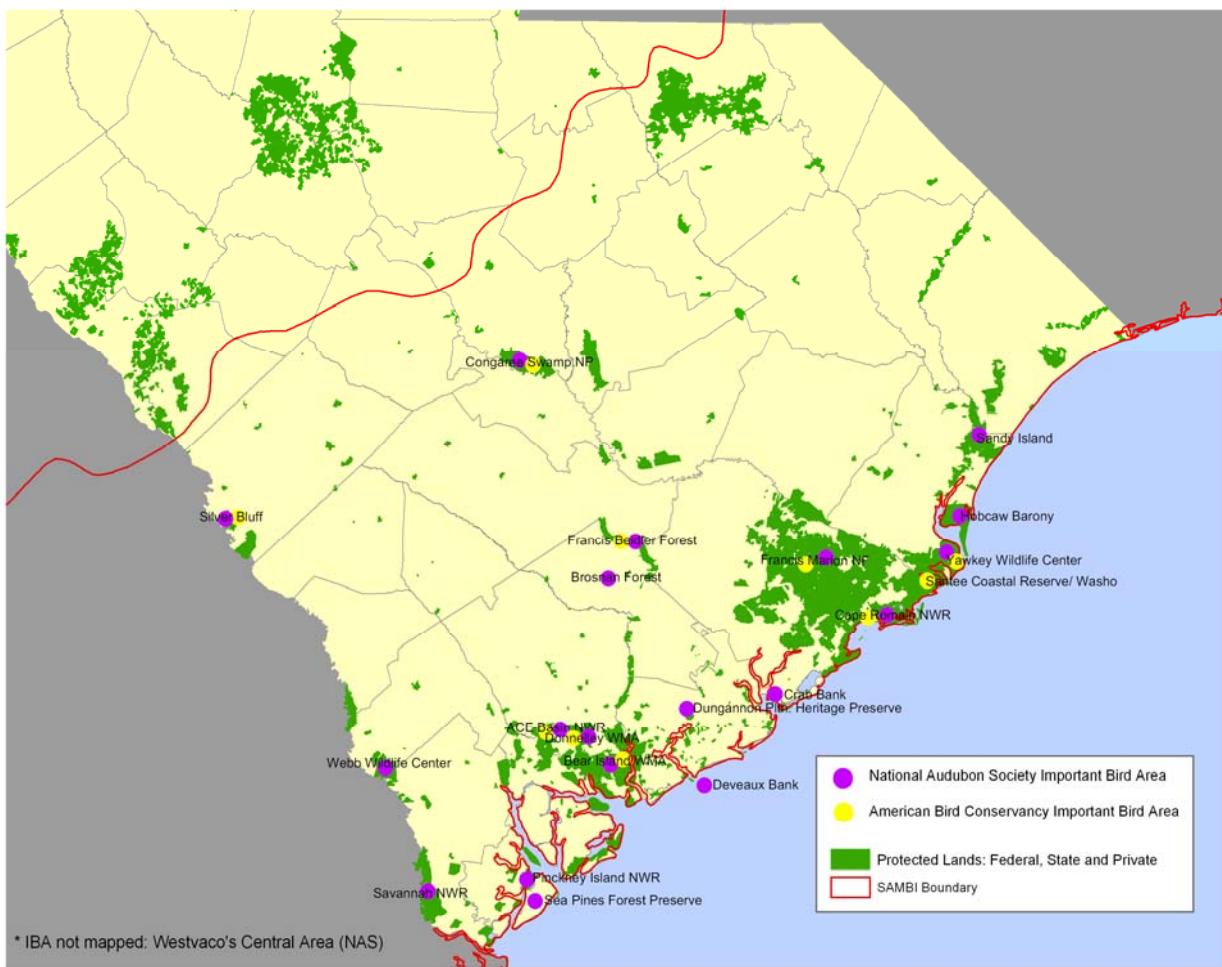


Figure 14. Important Bird Areas of the National Audubon Society (NAS) and the American Bird Conservancy (ABC) within the South Carolina Planning Region of the SAMBI.

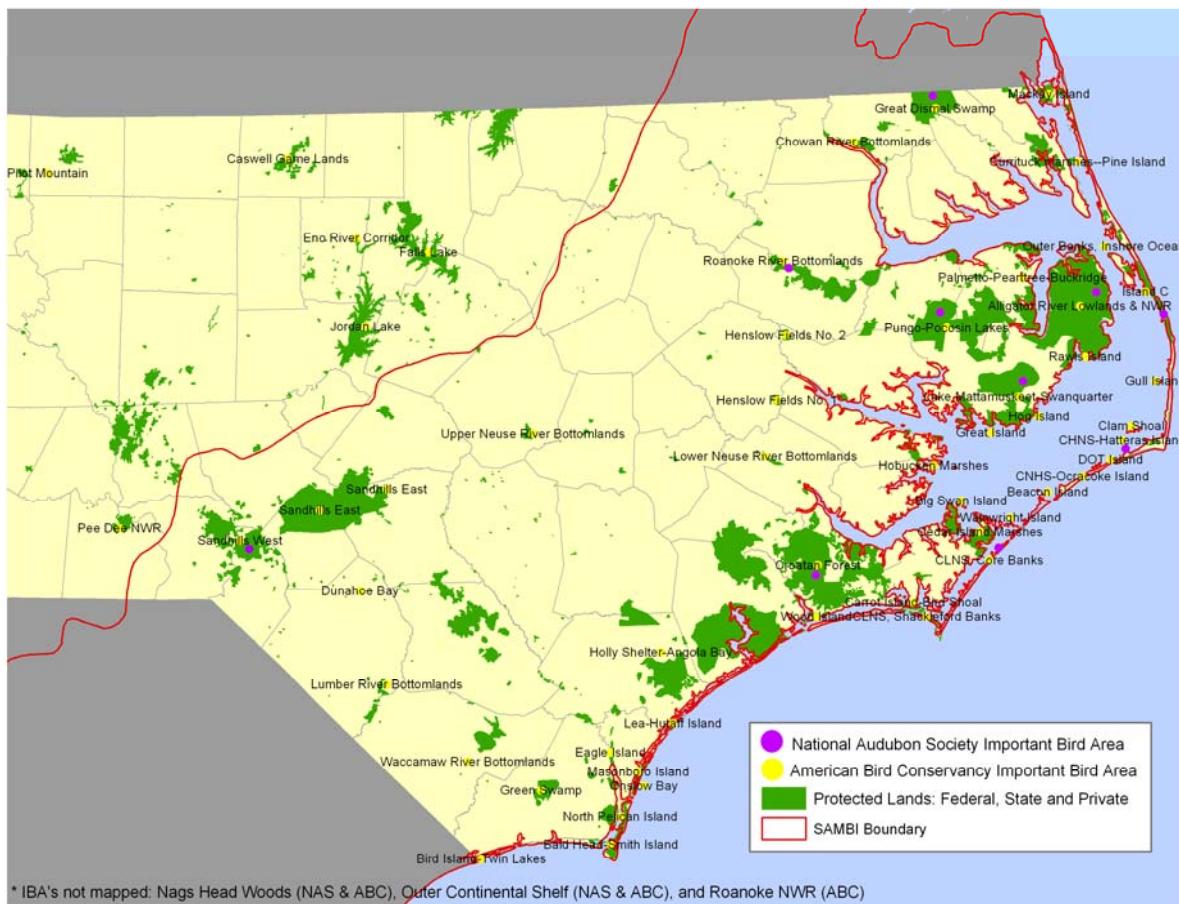


Figure 15. Important Bird Areas of the National Audubon Society (NAS) and the American Bird Conservancy (ABC) within the North Carolina Planning Region of the SAMBI.

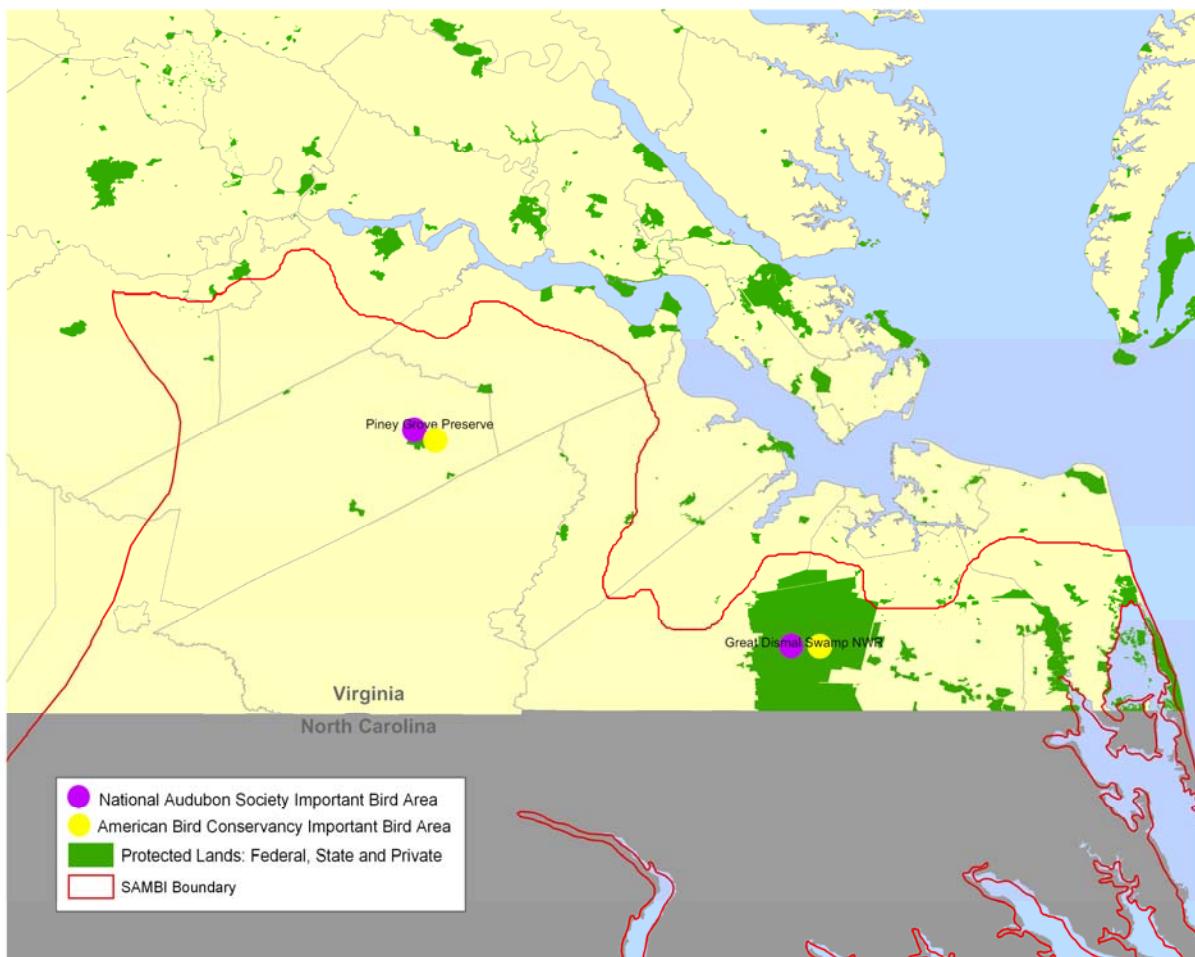


Figure 16. Important Bird Areas of the National Audubon Society (NAS) and the American Bird Conservancy (ABC) within the Virginia Planning Region of the SAMBI.

2) Protected Lands Coverage

Lands that are in public ownership (primarily federal and state), lands protected through non-governmental agencies, and private lands protected through conservation easements have been mapped for each state for the SAMBI planning region. These maps have previously been depicted in the previous section discussing IBAs for all five states. This coverage can be broken out by state, and can be used by State Working Groups to help direct conservation efforts. Availability of digital coverage for protected lands within each state varies. Generally, coverage for public lands is readily available; however, digital coverage for privately protected lands may require special permission to use. A protected lands coverage for the entire SAMBI area is presented in [Figure 4](#).

3) All Bird Focus Areas

Focus areas for waterbirds, shorebirds, landbird, waterfowl, and early successional/grassland species have been delineated for each state within the SAMBI area. These composite maps can be used with protected land coverage to help State Working Groups direct their conservation efforts. Digital coverage for each of these focus areas for each bird group for each state is available.

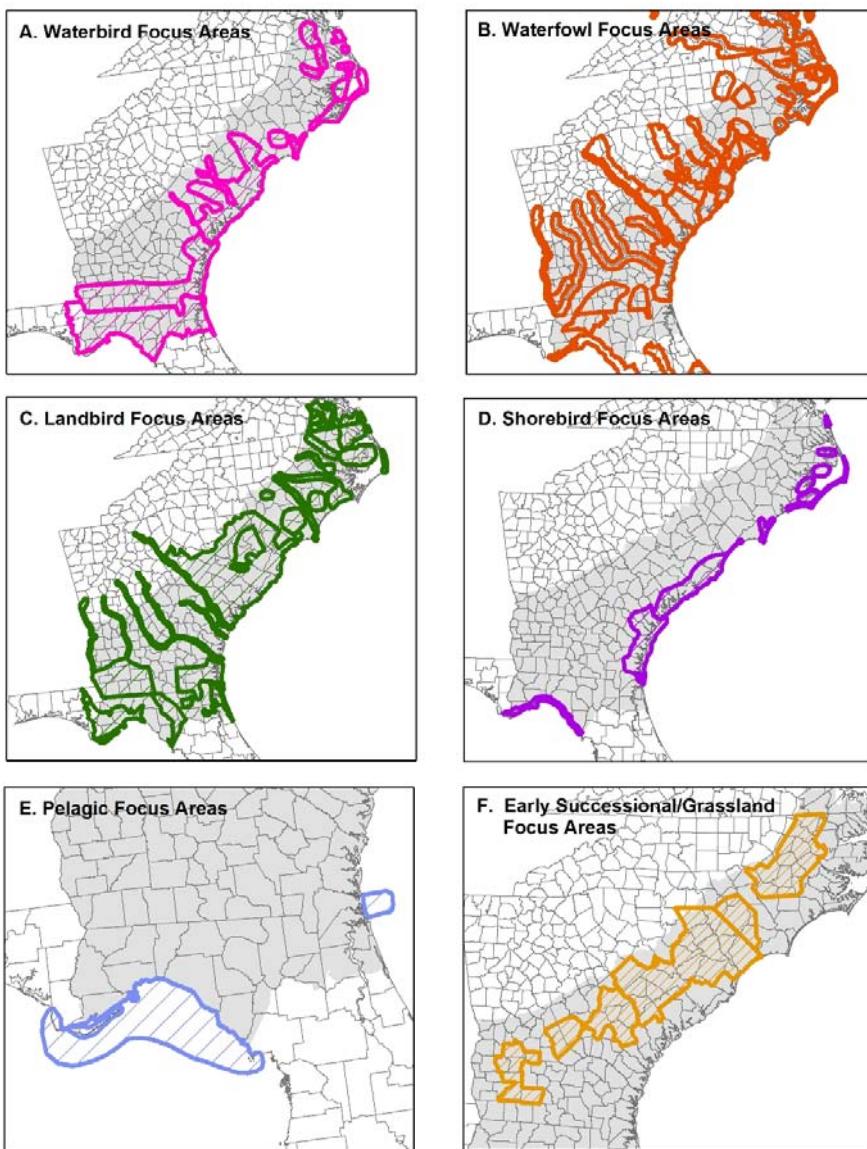


Figure 17. Focus Areas for SAMBI, clockwise from top left: waterbirds, waterfowl, landbirds, shorebirds, pelagic, and early successional/grassland birds.

4) Land Cover Maps

A land cover map for the SAMBI planning area is available and has been previously presented ([Figure 5](#)). Land cover maps are also available for each state. Digital data for landcover for the SAMBI planning and each state addressed in this plan are also available.

5) Where to Implement Conservation

Utilizing land cover maps, locations of protected lands, locations of IBAs, and the individual focus areas for each bird group in each state, State Working Groups can begin to develop strategies for conservation within their state for the conservation of high priority species and

habitats. All of these digital coverages (protected lands, IBAs, land cover, focus areas) are generally available and can be manipulated at the regional, state, or local level to help direct conservation at the local, regional, and national level.

A key part of the biological foundation needed by the Atlantic Coast Joint Venture for decision-making about priority bird conservation actions is an assessment of the capacity of the joint venture and specific regions and states within the joint venture to support breeding, wintering and migrating bird populations. Specifically, there is a need for resources that guide partners at the BCR and state level in determining where to deliver needed habitat conservation and what management actions are necessary to most effectively restore and sustain bird populations and achieve stated population goals.

The ACJV has laid out an overall approach for developing a habitat conservation design to meet these resource needs, including what questions should be answered, the specific resources needed to answer the questions, and steps to take to develop these resources. The following items are taken from the ACJV's vision and approach to landscape scale conservation.

Some of the major questions that need to be answered through a conservation design are:

Overview Question

1. On what specific lands within the SAMBI area and the states should the conservation community implement priority habitat conservation actions to most effectively achieve bird conservation objectives?

Bird Distribution and Abundance Questions

1. What is the distribution and abundance of priority bird species in within a state, the SAMBI area, throughout the joint venture, or at other scales?
2. Where are the sites with the highest abundance of priority species within states, the SAMBI area or the joint venture?
3. Where are the sites with the highest species richness of priority species?
4. How do the distribution of these sites relate to conserved and managed lands?

General Habitat Questions

1. What is the distribution of habitats that encompass groups of birds (habitats supporting groups of birds such as grasslands)?
2. What are the landscape attributes that are important for bird species (e.g. habitat patch size and shape) and where on the landscape are the habitat patches that best meet a species need?
3. What are the finer scale habitat attributes that are important for habitat quality for bird species including biological factors (e.g. structure and age of vegetation) and non-biological factors (e.g. slope, aspect, geology, hydroperiod).

General Habitat Capacity Questions

1. What is the capacity of the region to support a species population target?
2. How many hectares of habitat are necessary to support a species population target within a region?
3. Where on the landscape is this capacity or where can conservation partners/land managers direct their conservation and management efforts to create the necessary capacity?
4. How will conserving habitat for priority birds contribute to the conservation of other trust resources (listed species, interjurisdictional fish, etc...) and biological diversity?

General Management Questions

1. How do particular management regimes or expected changes in the amount and configuration of habitats via habitat loss and fragmentation impact the capacity of the region to support a population?
2. What are the trade-offs of implementing various management regimes on priority species with different habitat needs?

Some of the tools and resources that are needed to answer these questions are:

1. *Compiling and Mapping of Existing Information*

- Coarse-scale Habitat Maps/GIS Data – Consistent, seamless, coarse-scale map of current amounts and configurations of habitat classes based on widely available coverages including NLCD land cover (most recent available), NWI wetlands, hydrography, bathymetry, elevation, and other important habitat attributes.
- Coarse-scale Managed Lands Map/GIS Data – Consistent seamless, map of managed land polygons, including ownership and management.
- Maps of Focus Areas and Other Recognized Areas – Digital maps of polygons of focus areas identified by the bird initiatives and SAMBI, as well as Important Bird Areas, WHSRN sites, Large Marine Ecosystems, and other recognized bird conservation areas.
- Maps of Bird Distribution and Abundance based on Survey/Atlas results – Maps of locations of birds based on survey or atlas results, especially for rare, patchily distributed or concentrated species. Examples include the American Oystercatcher winter survey, Golden-Winged Warbler Atlas, New England Grassland Bird Survey, Atlantic Coast Colonial Waterbird Survey, SAMBI Shorebird and Waterfowl Surveys (Christmas Bird Count data?)

- Breeding Bird Survey Predicted Abundance/Trend Maps – Maps of predicted abundance and trends for fairly common or common species well-surveyed by the Breeding Bird Survey based on BBS models that extrapolate the BBS results to larger geographic areas such as counties or “Sepik blocks” but not tied to specific habitat attributes.
 - Information available through BBS website and analyses completed by John Sauer for NWRs

2. Habitat Maps and Models of Presence/Absence and Relative Abundance

- Coarse-scale Habitat Analyses – Digital maps utilizing NLCD and other coarse habitat information described above that has been analyzed to show distribution of habitats with certain attributes such as deciduous forest patches above a certain size.
 - Forest block analysis conducted by The Nature Conservancy for ecoregional planning
- Habitat Models Using Breeding Bird Survey Data – Models that predict presence/absence and/or relative abundance of priority species based on the relationship between BBS data and coarse level habitat attributes, for species well-sampled by the Breeding Bird Survey.
 - Presence/Absence models developed for state and regional GAP Analyses
 - Relative abundance spatial models (such as those developed by Throgmartin et al. for select BCRs and species)
- Habitat Models Using Other Survey Results – Models that predict abundance of priority species based on the relationship between survey data and coarse-level habitat attributes.
 - Relative abundance spatial models for woodcock singing ground surveys
 - Waterfowl, shorebird and grassland bird models in Prairie Pothole Region by HAPET offices based on waterfowl production and other surveys
 - Ducks Unlimited HEN models

3. Models that Predict Present or Future Capacity

- Landcover Models with NLCD and Supplementary Information – By using supplementary information such as the Forest Inventory Analysis data it may be possible to better model present habitat quality with NLCD landcover and predict the capacity of a given area to support populations. Alternatively, through the use of a valid statistical frame, it may be possible to conduct a more detailed vegetation analysis for a subsample of an area that can be extrapolated to the larger geographic area.
- Probabalistic Modeling – Models that predict the probability of a geographic area supporting a certain number of a species based on the amount of habitat available.

- Probalistic models such as those developed by Minnesota Forest Bird Initiative using LANDIS (future forest composition) models, point count and stand level vegetation surveys.

4. Additional Surveys and Modeling

- Under-surveyed species – Additional surveys for species missed by ongoing traditional monitoring programs like the BBS, such as secretive marsh birds and night-jars.
- Surveys to Validate Models – Additional surveys of priority species, vegetation, and other habitat-defining attributes, in locations to allow for refinement and validation of models.

Some tasks identified to develop these tools and resources are:

Refining Questions and Designing Approaches

- Work with ACJV Integrated bird Conservation Committee, Patuxent ACJV Science Team, the SAMBI State Working Groups, and others to refine flyway-wide questions and strategies for conservation design.
- Develop working groups within SAMBI to develop specific questions and strategies for conservation/landscape design.
- Work with Center for Conservation Biology under the IAFWA grant (if funded) to examine habitat mapping and modeling efforts from around the country to assess the best overall strategy for “implementing optimal landscape designs for bird conservation” in BCRs in the ACJV.
- Work with other FWS programs to assess strategies for conservation design to meet their needs consistent with the NEAT Team approach and present recommendations to the Regional Director. Develop a NEAT Team Science Support proposal for conservation design in Region 4 and with U. S. Geological Survey (USGS) staff at Patuxent and other locations. A current Science Support Proposal has been submitted with the SAMBI Planning region as the target region, with the Roanoke-Tar-Neuse-Cape Fear Ecosystem area targeted specifically for initial analyses.
- Discuss overall approach for conservation design with USGS BRD senior staff and develop collaborative approaches.
- Look to non-traditional sources, such as NASA’s Earth Science Division, for input on mechanisms to accomplish conservation design.

Compiling Existing Information

- Work with USGS, USFWS and other partners to complete the compiling and mapping of basic existing species and habitat information for the joint venture area including the most recent NLCD data. Organize information by BCR, State, and JV. Utilize SAIN contract to compile this information for BCR 28 and same staff person to assist with larger effort. Utilize relationship with regional NBII node and NBII bird conservation node to make the information available to partners through a Web site.
- Collaborative effort of FWS programs to compile habitat information of mutual interest consistent with NEAT Team approach.
- Work with USGS NBII regional bird conservation node to develop a database of bird conservation information from the State Comprehensive Wildlife Conservation Strategies.

Completing and Assessing Ongoing Modeling Efforts

- Assess validity/utility of bird distribution modeling as is being done in the Atlantic Northern Forest and the need for a similar approach in the SAMBI area.
- Work with the Southeastern Regional GAP to provide abundance maps for priority species in BCR 27. Assess northeastern Regional GAP efforts.
- Assess the usefulness of models being developed by the USGS Upper Midwest Environmental Science Center for BCR 13 and BCR 28 and the opportunities and need to expand this approach to other species and to other BCRs.

Developing Additional Models

- Work with USGS to develop spatial models of avian abundance for selected priority species in SAMBI and in the ACJV (possibly as part of a Science Support grant). These models could utilize NLCD and BBS data and would be supplemented when possible by other datasets such as Forest Inventory Analysis data.
- Develop probabilistic models to predict the capacity of regions to support bird populations. Work with USGS, USFS and others to develop models (possibly as part of a Science Support grant).
- Work with Center for Conservation Biology under the IAFWA grant (if funded) to design and fully implement a mapping and modeling approach for Bird Conservation in BCR 30. Utilize a similar approach in other BCRs as appropriate.

Collecting Additional Habitat, Landscape Attribute and Species Information

- Work with FWS NEAT Team partner programs and other partners to develop a strategy for collecting additional habitat and landscape attribute information. Work with USGS on a statistical approach for extrapolating to larger geographic areas.

- Develop strategy to conduct additional surveys that will both allow for validation of models and for the development of long-term database for future modeling efforts. Work with USFWS MBMO, states and others to develop and implement additional surveys for under surveyed species, priority species, and priority geographic areas. Work with partners involved in Multi-state monitoring grant (if funded).
- Expand SAMBI shorebird, waterfowl and waterbird surveys to the entire ACJV.

6) Designing Sustainable Landscapes for Bird Populations in the Eastern United States

With the tools, concepts, and needs identified from the previous section on where to best deliver habitat conservation in the SAMBI area, staff of the Atlantic Coast Joint Venture in collaboration with USGS Coop Units at North Carolina State University and Auburn University, a multi-year multi-state proposal was submitted in 2007 to the Association of Fish & Wildlife Agencies as a National Conservation Need entitled “Designing Sustainable Landscapes for Bird Populations in the Eastern United States”. This project was fully funded and work has begun with regional workshops seeking information from SAMBI partners from each of the five states in the SAMBI area. The overall objective of this proposal is to develop a consistent methodology and to enhance the capacity of states, joint ventures and other partners to assess and design and manage sustainable landscapes for birds and other wildlife in the eastern United States. Specifically, this project would develop and implement a framework and tools to 1) assess the current capability of habitats in ecoregions in the eastern United States to support sustainable bird populations; 2) predict the impacts of landscape-level changes (e.g., from urban growth, conservation programs, climate change) on the future capability of these habitats to support bird populations; 3) target conservation programs to effectively and efficiently achieve objectives in State Wildlife Action Plans and bird conservation plans and evaluate progress under these plans; and 4) enhance coordination among partners during the planning, implementation and evaluation of habitat conservation through conservation design.

This project will build on several regional efforts that are currently developing or have recently completed spatial data. Most notable is the Gap Analysis Program (GAP) which will be delivering a southeast regional land cover map based on Ecological Systems (www.nature.org/publications/usEcologicalsystems.jsp). This will be the most detailed land cover map to date at this resolution. Furthermore, GAP is expanding their efforts to include the Northeastern U.S. and will begin delivering interim mapping products to cooperators by 2009 and will have a consistent, seamless land cover product by 2011 for the entire Eastern United States. Ecological Systems has quickly become a defacto standard for habitat classification for both remote sensors and habitat modelers. The importance of this consistent approach cannot be overstated given the myriad of habitat classification systems and descriptions across multiple states, NGO's and federal agencies. In addition to land cover, GAP products include terrestrial vertebrate species predicted habitat models. While these models are limited in that they only predict presence/absence, they do provide a solid foundation for further refinement and development of abundance/population models through the supporting ancillary data sets and extensive habitat relationship database used in their development (www.basic.ncsu.edu/segap). Furthermore, GAP is supporting research into extending species-habitat models beyond

presence/absence to include habitat suitability indices as well as predictions of population densities.

Several other regional spatial analysis efforts that will be integral to the completion of this project include the Longleaf Decision Support Tool (DST) being developed by the East Gulf Coastal Plain Joint Venture and the Northeast Habitat Classification and Mapping project by the Northeast Association of Fish and Wildlife Agencies (NEAFWA). This project will build upon the single habitat Longleaf DST by integrating the needs of priority species across the suite of habitats they use; thereby incorporating the needs of species such as Northern Bobwhite that use a variety of habitats often occurring as mosaics in the landscape. The Northeast Habitat Classification and Mapping project is developing an Ecological Systems based habitat classification that crosswalks habitats mentioned in all State Wildlife Action Plans in the Northeast and the Ecological Systems occurring in the Northeast.

B. Conservation Strategies

Waterfowl, Shorebirds, Waterbirds, and Landbirds

Habitat Protection

1. Fee title acquisition: Acquisition of lands to be owned by a conservation agency or organization and managed for wildlife conservation in perpetuity, especially in focus areas and in areas where acquisition of lands builds upon networks of contiguous existing protected lands. Major partners include the state fish and wildlife and land conservation agencies, National Wildlife Refuges, national Forests, The Nature Conservancy, land trusts, and state Audubon chapters.
2. Conservation easements: Conservation easements with private landowners and local governments will be used to acquire legal interests to conserve and manage important wetlands and associated upland habitats and limit development while allowing some use by the landowner consistent with the easement conditions.
3. Cooperative agreements: Agreements with corporations, government agencies, private landowners, and other organizations will be used to protect wetlands and integrate compatible land use practices that benefit wetlands and associated upland habitats.
4. Leases: Long-term leases with private landowners, corporations, and other private entities can be used to implement wetland protection and management activities.
5. Financial incentives: Develop state and local legislation that would provide financial benefits, i.e., alteration in property taxes to individual landowners, to encourage protection and conservation of wetlands and associated upland habitats.

Habitat Restoration

6. Restore tidal wetland hydrology: Restore flow to tidal creeks and marshes that has been cutoff or reduced by placement of roads, dikes, and undersized culverts resulting in a major change in the marsh structure and often resulting in the invasion by *Phragmites*.
7. Restore drained wetlands : Restore drained and ditched freshwater wetlands by eliminating drains and ditches, restoring hydrology and planting or seeding wetland plants where needed.
8. Restore Riparian Systems: Restore the natural flow of streams and floodplain wetlands that have been straightened or altered.

Habitat Enhancement and Management

9. Improve water level management on managed wetlands: Upgrade existing federal, state, and other managed wetlands areas by providing adequate water control structures, dikes, etc., to maximize management opportunities and improve the quality of waterfowl breeding, wintering, and migration habitats as well as to provide for seasonal waterfowl, waterbird and shorebird needs. Impoundment management is particularly important in the southeast Atlantic Coastal Plain where there are thousands of acres of former rice plantations;
10. Restore vegetation to impacted wetlands: Implement measures to restore natural vegetation and improve the health and productivity of wetland habitats that have deteriorated due to human impact and overgrazing by snow geese and other impacts resulting in loss of vegetation;
11. Restore converted wetlands: Where appropriate, restore forested wetlands that have been converted to other wetland types through planting and management;
12. Open marsh water management: Implement management measures to improve water surface and tidal exchange in salt marsh ecosystems by plugging ditches and creating ponds and channels for the benefit of waterfowl and waterbirds as well as the control of mosquitoes.
13. Restore and Manage Riparian Buffers: Establish and restore riparian buffers through planting, stream bank fencing and other techniques.
14. Beaver management: Where applicable, encourage, develop, and support state beaver management policies and programs that would manipulate beaver populations to improve habitat for black ducks, other waterfowl, and wildlife. Also, install devices that allow for beaver-enhanced wetlands but prevent flooding of roads.
15. Control exotic and invasive vegetation: Eliminate or suppress the spread of invasive and exotic plants in wetlands through the use of physical, biological, or chemical agents.
16. Prescribed burning: Use prescribed fire to restore natural fire-dependent ecological communities such as coastal grasslands and heathlands.

17. Implement Farm Bill: Work with NRCS to implement Farm bill conservation programs including Conservation Reserve Program, Conservation Reserve Enhancement Program, Wetland Reserve Program, Wildlife Habitat Incentive Program and others to enhance wetlands and buffers in agricultural areas of the ACJV.

18. Enhance habitats on Federal lands: Work with federal agencies such as the U.S. Fish and Wildlife Service, U.S. Forest Service and the Department of Defense to develop and assist in the implementation of programs that would better manage and enhance waterfowl habitats on federal lands.

Seabirds

19. Seabird conservation efforts should develop partnerships with fishery industries and sport anglers.

20. Impacts to seabirds from offshore and inshore fisheries and should be addressed in all future fishery plans.

21. The policy of elimination of waterbird bycatch in fisheries should be embraced by all fisheries management entities.

22. Oil effects on seabirds should be minimized through increased enforcement of shipping activities, safe operational procedures, spill clean up, and rehabilitation of oiled birds.

23. Dumping of debris, line, and nets should be prohibited and strictly enforced.

24. Non-persistent lined, nets, and traps should be developed.

25. A state colonial waterbird coordinator should be appointed within each state of the SAMBI planning area.

26. Death and morbidity of seabirds should be monitored wherever it occurs.

27. Important foraging, migrating, and wintering seabird areas should be identified and monitored.

28. Increase monitoring of seabird bycatch.

29. Seasonal population estimates, distribution, and abundance of seabirds are needed in the Southeast Continental Shelf and Gulf of Mexico.

Other Conservation Actions

30. Review regulatory legislation and enforcement: Evaluate existing wetland protection legislation and work with ongoing programs to strengthen or improve existing federal-state wetland protection efforts and to facilitate wetland management activities. Coordinate with the EPA, the Corps of Engineers, and appropriate state agencies to implement wetland protection provisions of the Federal Water Pollution Control Act.

31. Streamline regulations for beneficial projects: Encourage and support measures that would facilitate implementation of management actions in wetlands to benefit waterfowl, waterbirds, shorebirds, landbirds, and other wildlife.
32. Mitigation: Work with federal and state regulatory agencies to ensure mitigation policies and mitigation actions resulting from development projects result in enhanced wetland management opportunities.
33. Information and education: Develop informational-educational leaflets/brochures, audio-visual programs, and other techniques to generate public interest and support for waterfowl and wetlands conservation.
34. Extension education on best management practices: Develop “how to” information for private landowners. Utilize existing network or develop and implement an extension education program to encourage private individuals to conserve and manage wetlands and associated habitats and utilize best management practices.
35. Public use management: Carry out public education efforts and provide public use opportunities in a manner compatible with reducing or eliminating disturbance to feeding or loafing waterfowl during critical winter periods.
36. Watershed protection and management: Eliminate degradation of wetland health and productivity by municipal waste, agricultural runoff, sedimentation, and industrial contaminants by developing guidelines and providing input to watershed management and estuary plans.
37. Predator management: Monitor predator populations on federal and state waterfowl management areas and implement appropriate programs to reduce depredation in problem areas. The impact of feral cat populations upon many populations of birds needs to be addressed.
38. Eliminate mallard release: To reduce unnecessary competition between black ducks, mottled ducks and released mallards, improve feeding opportunities for black ducks during the winter season; eliminate state and private mallard release programs to reduce the chances of pair bonding and hybridization between mallards and mottled or black ducks.
39. Work closely with beach managers and communities (to include sea turtle monitoring crews) and educate them on ways to minimize plover nest disturbance and to avoid running over plover chicks where use of vehicles are allowed on beaches.
40. Provide specific guidance for both private and public land managers to slow the timing of spring draw-downs and build in habitat recommendations involving teal considerations in autumn to closely match peak shorebird habitat needs in their respective areas.
41. Provide proper incentives for private cooperating landowners to delay planting for about a month.
42. When it is necessary to conduct beach re-nourishment projects, work with communities, State and Federal agencies, on the timing and design of the project to minimize disturbance and impacts on shorebird food base. ([Workshop on Dredging, Beach Nourishment and Birds on the South Atlantic Coast](#))

43. Assess individual managers' current contribution as well as their capacities to help achieve habitat objectives outlined in this report, to include the potential to close beaches where excessive public use is shown to be detrimental to important nesting habitat.

44. Work with all interested parties to improve freshwater inputs, in terms of both flows and quality, into estuarine systems.

C. Funding Sources

Conservation funding is available through multiple sources and as a multi-agency organization the SAMBI partners are in a position to vie for resources of all types. Partnerships should be used to their maximum advantage to seek out funding sources and often funding is contingent upon the existence of well-founded partnerships.

1. The North American Wetlands Conservation Act

One of the most important funding sources available for land managers today is the North American Wetlands Conservation Act (NAWCA). The partners of the NAWMP played a role in the 1989 passage of the North American Wetlands Conservation Act (NAWCA). The NAWCA, operated by the U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation, provides matching grants to private organizations, public organizations, or individuals who have developed wetlands conservation projects that require partnerships and are within the United States, Canada, or Mexico. NAWCA allows for a secure foundation of long-term funding support for conservation projects to be implemented in the wetlands and associated uplands that many birds depend upon. It also furthers the ability for the three NAWMP signatories, United States, Canada, and Mexico, to coordinate projects on a grand scale. [NAWCA](#) is a tremendous resource and has supported over 1,300 partners.

2. [National Coastal Wetlands Conservation Grant Program](#)

The Coastal Wetlands Planning, Protection, and Restoration Act (Title III of P.L. 101-646) established the National Coastal Wetlands Conservation Grant Program to acquire, restore, and enhance wetlands of coastal States and the Trust Territories. Since enactment of the law in 1990, the Service has been working with the States to acquire, restore, manage, or enhance coastal wetlands through a matching grants program. To date, about \$152 million in grant monies have been awarded to 25 coastal States and one U.S. Territory and to acquire, protect or restore over 76,488ha (189,000 acres) of coastal wetland ecosystems. This program has been very effective in meeting goals of "all bird" conservation in the SAMBI planning region.

3. [Neotropical Migratory Bird Conservation Act Grant Program](#)

Passed by the U.S. Congress in 2000, the Neotropical Migratory Bird Conservation Act (Act) establishes a matching grants program to fund projects in the United States, Latin America, and the Caribbean that promote the conservation of these birds. The Act's purposes are to:

- perpetuate healthy populations of neotropical migratory birds,

- assist in the conservation of these birds by supporting conservation initiatives in the United States, Latin America, and the Caribbean, and
- provide financial resources and foster international cooperation for those initiatives.

This program is relatively new and has not been widely used in the SAMBI Planning area for implementation. However, as the program builds, this program is expected to assist in achieving the goals of SAMBI, particularly for landbirds.

VII. RESEARCH NEEDS

A. Waterbirds

Four basic fronts of waterbird research have been identified. These are:

- 1) Basic inventory of species/groups and habitats
- 2) Species oriented research, including risk and vulnerability, trend analyses, and limiting factors
- 3) Applied research to include fisheries and aquacultural conflicts, fishery stock assessment and seabird populations, predator impacts, and effects of human disturbance
- 4) Basic ecology, including metapopulation dynamics, winter ecology, ecology of prey species, and effects of long term ecosystem changes

For a detailed description of waterbird research needs, visit:

[Waterbird Research Needs](#)

B. Pelagic

1. Determine the role of commercial fisheries in seabird mortality.
2. Determination population level effects of oil and hazardous materials on seabirds.
3. Identify key marine habitats and or focus areas.
4. Determine the value of sargassum to seabirds.
5. Effects of sargassum harvest to seabird habitat and populations.

C. Shorebirds

1. Assess the degree of depredation on nesting populations.
2. Determine factors inhibiting successful reproduction of plovers and oystercatchers.
3. Determine shorebird disturbance tolerance levels, primarily from human use and their pets. Determine whether the disturbances are at such levels that shorebirds are unable to store as fat an average of 1 gm of food per day, which is thought to be necessary for successful migration.

4. Determine effects, if any, from contaminants for migrant versus resident populations in known problem areas.
5. Determine factors influencing or inhibiting effective management of impoundments for shorebirds, including hydrodynamics, mosquito control, vegetation control protocols, minimizing exposure to contaminants, and public use (including possible disturbances associated with early teal seasons).
6. Determine factors influencing invertebrate diversity and abundance, among both natural and managed habitats, among seasons, and among all the conditions listed under item 5.
7. Investigate the actual effects of beach renourishment on shorebird foraging habitat and determine the time necessary for a return to pre-renourishment shorebird food resources.
8. Develop local and regional monitoring protocols that may improve upon the International Shorebird Survey.

D. Waterfowl

Encourage, facilitate and coordinate applied research, and disseminate results to test key planning assumptions and reduce management uncertainties to improve conservation design and implementation.

Strategy 1: Develop a Science Advisory Committee (including Patuxent Wildlife Research Center members) to discuss and address priority research needs of the joint venture;

Strategy 2: Work cooperatively with the ACJV Waterfowl Technical Committee, Integrated Bird Conservation Committee and Science Advisory Committee to identify priority applied research needs for bird conservation within the joint venture area.

Strategy 3: Seek funds for priority applied research projects through USGS Science Support and Quick Response Funding, National Fish and Wildlife Foundation and other funding sources or cooperative agreements.

Future research in the joint venture will focus on determining limiting factors and testing assumptions to allow for habitat models and population-based habitat objectives. These efforts will also allow for an evaluation of the effectiveness of conservation actions on these populations.

E. Land Birds

There exists a voluminous and extensive database relative to landbird research needs at: [Landbird Research Priorities and Needs](#).

VIII. MONITORING

A. Monitoring

Public investment in natural resource conservation has grown rapidly in recent years, along with the recognition of potential benefits in coordinating conservation activities. Increasingly, bird conservation is coordinated through organizations such as the North American Waterfowl Management Plan (NAWMP), Partners in Flight (PIF), the Waterbird Conservation for the Americas, the United States Shorebird Conservation Plan, and the NBCI. NACBI provides a forum to facilitate integrated conservation, and the emerging State Comprehensive Wildlife Conservation Strategies provide important incentives for coordination.

Monitoring can play a key role in supporting the continued growth of these and other bird conservation efforts by providing the information needed to inform decisions and evaluate their effectiveness. The value of coordination is especially apparent in bird monitoring, where economies of scale and effort can be realized and more useful monitoring products can be developed through coordination.

1. Waterfowl - annual mid-winter waterfowl inventories are conducted by federal and state agencies to get annual indices of wintering waterfowl populations along the Atlantic Coast. Data and analyses are available from the USFWS [Migratory Bird Data Center](#) website. Waterfowl population objectives for different flyways are presented in the 2004 update of the North American Waterfowl Management Plan. Since many of the priority waterfowl species in the SAMBI planning region are primarily migrating or wintering species in the BCR, the mid-winter inventories provide a means of tracking wintering population trends and distributions.

Additional monitoring for waterfowl in the South Atlantic through the South Atlantic Migratory Bird Initiative website is discussed in further detail below.

2. Shorebirds - regional assessments of important sites for monitoring shorebird are being developed as part of PRISM, which seeks to accomplish the monitoring goals of the U.S. and Canadian shorebird conservation plans. Preliminary information for the assessment of the South Atlantic region has been compiled and is available at [PRISM](#). These assessments are based in large part on International Shorebird Survey data, which are housed at the Manomet Center for Conservation Biology and are also available for review. Contact Manomet for more information on shorebird survey data.

In addition to survey data, shorebird population estimates have been presented at the continental level in the [U.S. Shorebird Conservation Plan](#), as well as at the regional level in the Southeastern Coastal Plains-Caribbean Region Report.

Additional monitoring for shorebirds in the South Atlantic, and in the entire Atlantic Flyway, through the South Atlantic Migratory Bird Initiative website is discussed in further detail below.

3. Waterbirds - surveys of waterbird colonies along the Atlantic Coast have occurred regularly in states in the SAMBI planning region. Summaries of these survey data for individual species by state is readily available from the State Working Groups.

Most recently, the U.S. Geological Survey Arizona Cooperative Fish and Wildlife Research Unit has developed a framework and protocol for monitoring marsh birds in North America to better assess population status and trends of high priority marsh birds and emergent wetland habitats (Conway 2004).

Monitoring for marsh birds/waterbirds through the SAMBI website is needed, and is currently being considered as an integral component of this monitoring website.

Pelagic – the following monitoring needs have been identified for pelagic species:

- Death and morbidity of seabirds should be monitored wherever it occurs.
- Important foraging, migrating, and wintering seabird areas should be identified and monitored.
- Increase monitoring of seabird bycatch.
- Seasonal population estimates, distribution, and abundance of seabirds are needed in waters of the Southeast Continental Shelf and Gulf of Mexico.

4. Landbirds – a variety of programs are currently being used to monitor landbirds, including Breeding Bird Atlas projects, Breeding Bird Surveys, Christmas Bird Counts, and Avian Point Counts. These and related programs and databases are accessible at [Patuxent Wildlife Research Center Research Activities](#). Considerable attention is being given to point counts in the southeastern United States. The U.S. Forest Service, Region 8, has an extensive point count database that includes the SAMBI planning region, and this database is being used to build bird-habitat relationship models, and to assess population trends of species, particularly at the BCR level.

5. Other – A very important component of the NBCI is to implement and monitor Practice CP33, Upland Habitat Buffers for uplands birds, with primarily northern bobwhite being considered. All states in the SAMBI planning region have acreage allocations for this Practice.

B. South Atlantic Migratory Bird Initiative and Website

1. Program - The South Atlantic Migratory Bird Initiative (SAMI) monitoring program is a coordinated waterfowl and shorebird monitoring program developed under the auspices of this implementation plan for the purpose of monitoring short and long term population numbers and distribution of waterfowl and shorebirds seasonally, and to monitor habitat management goals as established in the Southeastern Coastal Plains-Caribbean Region Report, U.S. Shorebird Conservation Plan. This program was developed in the Manteo Office of the U.S. Fish & Wildlife Service for use primarily in the southeastern United States (Puerto Rico-North Carolina). However, the intent is to implement this program from Virginia through Maine (the remainder of the Atlantic Flyway) in the near future, providing a flyway scale program for monitoring waterfowl, shorebirds, and waterbirds. This program has both a public site and a secure site. The public site, <http://samigbird.fws.gov/>, is a site that the public can access to view waterfowl and shorebird numbers seasonally at a given place in the southeastern United States. Examples of where information is available from can be found in Figures 18 and 19.

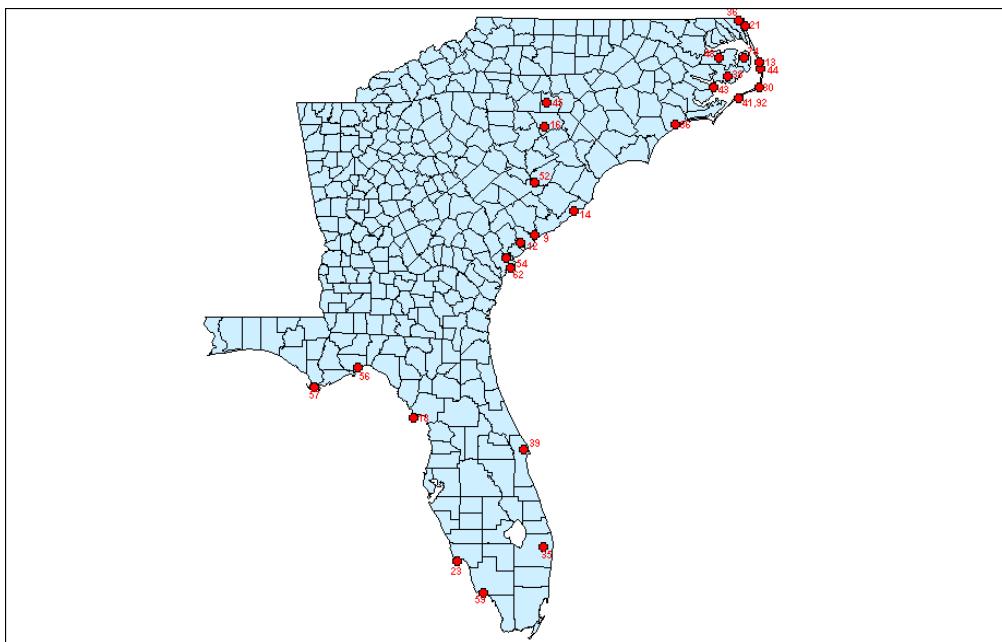


Figure 18. Areas Surveyed for Shorebirds in FL, GA, SC, and NC for SAMBI.

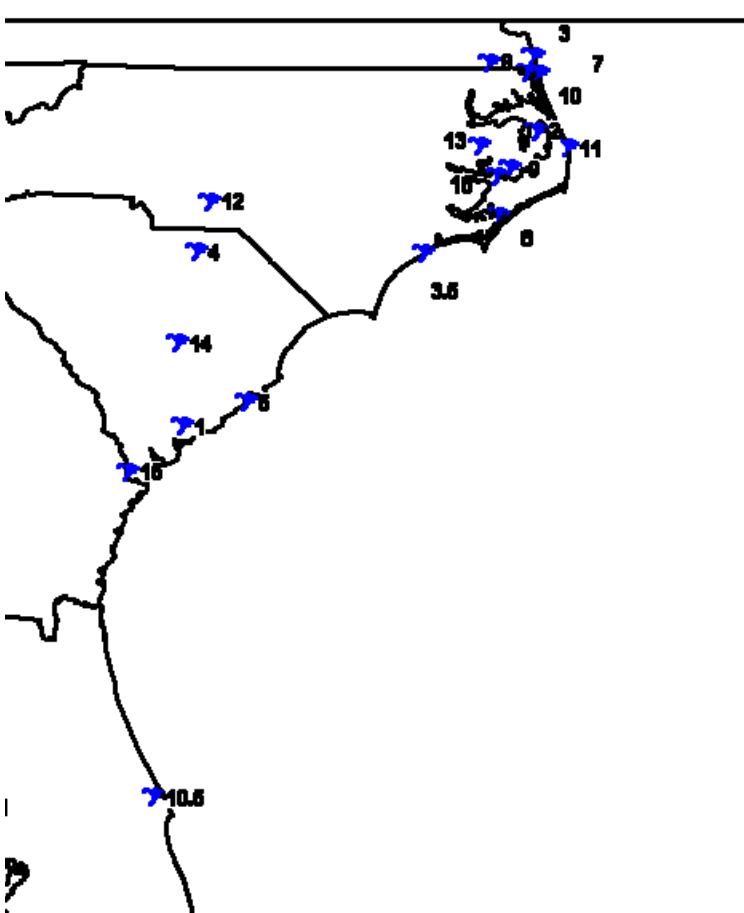


Figure 19. Areas Surveyed for Waterfowl in FL, GA, SC, and NC for SAMBI.

The SAMBI public website has more complete maps and listings of all areas that are currently being monitored. The secure website is for federal, state, and private land managers participating in the program to enter data on waterfowl and shorebirds numbers, and habitat acres being managed for shorebirds. All federal, state, and private interests managing for waterfowl and shorebirds are encouraged to participate in this program. This program currently provides the following information and uses:

- Distribution and trends of wintering waterfowl along the south Atlantic coast throughout the wintering,*
- Shorebird migration timing and trends along the entire coast,*
- Occurrence of rare or high priority species,*
- Viewing “real-time” buildup and declines of shorebirds in managed properties to the south will enable managers to the north to fine tune dates of impoundment drawdown, thus, better managing habitats in synchrony with the current migration season,*
- Providing a better network for monitoring of color banded shorebirds through the migration period,*
- Public access to data will mean less demands on Refuge staff for information on waterfowl/shorebird numbers, and*
- Better management decisions on how to allocate impoundment acres to meet the needs of both waterfowl and shorebirds.*

2. Relation to PRISM - This section discusses the relationship of PRISM to the shorebird component of the SAMBI coordinated shorebird effort.

PRISM is a blueprint for surveying shorebirds in North America, designed to meet the monitoring goals of the U.S. and Canadian Shorebird Conservation Plans (Brown et al. 2001; Donaldson et al. 2001). Both plans have identified the need for reliable information on the distribution, abundance and population trends of shorebirds in North America. PRISM has four major elements designed to address these information needs: arctic and boreal breeding surveys, temperate breeding surveys, temperate non-breeding surveys and neo-tropical surveys.

The temperate non-breeding survey component is intended to standardize data collection and storage among existing initiatives including the International Shorebird Surveys (ISS), Canadian Maritime Shorebird Survey, Western Shorebird Survey and the South Atlantic Migratory Bird Initiative (SAMBI).

Information gathered by ISS Cooperators over the last 30 years can suggest population declines, but analyses for population change have historically had weak sensitivity. This has prompted the ISS to sharpen its monitoring efforts by participating in the initiative of PRISM to estimate the sizes and trends of shorebird populations. Manomet is thus working to restore and initiate additional surveys at key sites along the Atlantic coast. The goal of the migration survey component of PRISM is to produce estimates of the mean number of shorebirds present during

the survey period for each focal species. Focal species for PRISM and SAMBI are found in Table 8.

CODE	SPECIES
BBPL	Black-bellied Plover
SNPL	Snowy Plover
WIPL	Wilson's Plover
SEPL	Semipalmated Plover
PIPL	Piping Plover
KILL	Killdeer
AMOY	American Oystercatcher
GRYE	Greater Yellowlegs
LEYE	Lesser Yellowlegs
SOSA	Solitary Sandpiper
WILL	Willet
SPSA	Spotted Sandpiper
WHIM	Whimbrel
LBCU	Long-billed Curlew
MAGO	Marbled Godwit
RUTU	Ruddy Turnstone
REKN	Red Knot
SAND	Sanderling
SESA	Semipalmated Sandpiper
LESA	Least Sandpiper
DUNL	Dunlin
SBDO	Short-billed Dowitcher
COSN	Common Snipe

Table 8. Focal Shorebird Species in the Southeast for PRISM and SAMBI.

PRISM compatible surveys in the Southeastern U.S. will fall under the existing network of the South Atlantic Migratory Bird Initiative (SAMBI). Shorebird surveys in this region are underway in a network of wildlife management areas and refuges in NC, SC, GA and FL. Currently, the ISS is working to expand survey coverage in this region and contribute additional sites to the SAMBI network. The ISS will initiate surveys on non-refuge and private lands, which SAMBI is poised to include, but that have not traditionally been part of the network.

All new volunteers that Manomet recruits in the SAMBI area are requested to submit their results on the SAMBI database, and all PRISM sites in the SAMBI area become a SAMBI site for the coordinated monitoring effort, and therefore, have a dedicated space on the SAMBI shorebird website. However, not all SAMBI shorebird sites are PRISM sites, as Manomet has determined that not all SAMBI sites meet the criteria for a PRISM site. PRISM sites in the southeast are displayed in [Figure 20](#).

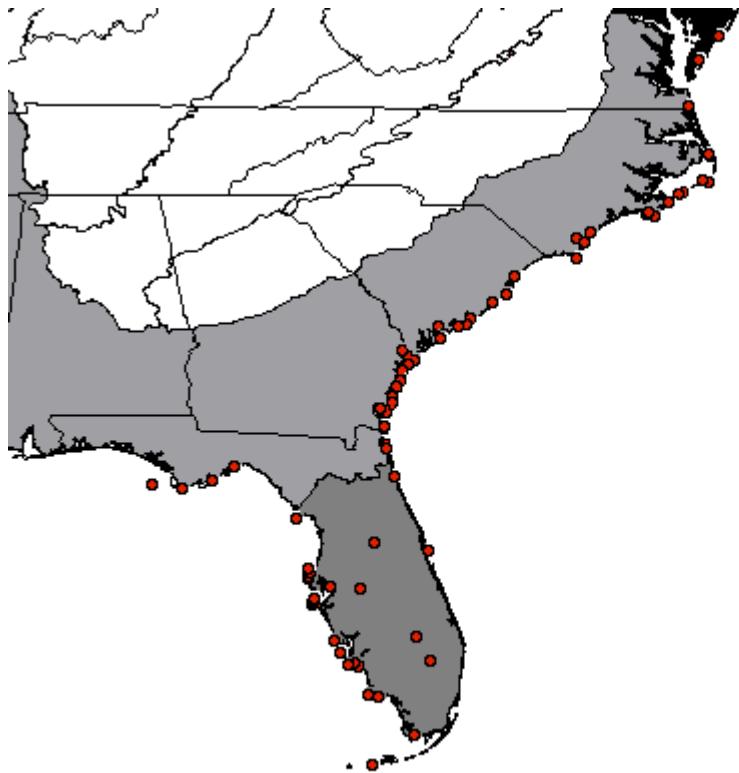


Figure 20. PRISM (and SAMBI) Shorebird Survey Sites in the Southeast.

For those stations that report directly to SAMBI, shorebird count data can be “dispersed” to the ISS on an annual basis. By the same token, for those cooperators who do *not* elect to enter their shorebird counts on the SAMBI database, the ISS will provide the shorebird count data to SAMBI on an annual basis. The SAMBI web interface manager at the U.S. Fish & Wildlife Service Office in Raleigh, NC, will facilitate the exchange of count data between the ISS and SAMBI.

Currently, ISS from the SAMBI area, SAMBI shorebird surveys, and PRISM shorebird surveys in the SAMBI area are all being consolidated into a single database, providing reliable information on the distribution, abundance and population trends of shorebirds in the SAMBI area, the Atlantic Flyway, and North America.

3. Developments

There are two primary developments occurring with the SAMBI coordinated waterfowl and shorebird monitoring effort. These are:

- 1) To fully incorporate the waterbird and marsh bird monitoring at the regional (SAMBI) level and flyway (Atlantic) scale.
- 2) To fully engage and implement federal, state, and private interests in monitoring of waterfowl, shorebirds, and waterbirds throughout the entire Atlantic Flyway, focusing on cooperation and participation from the Mid-Atlantic and North Atlantic States.

Staff of the ACJV and Regions 4 and 5 of the U.S. Fish & Wildlife Service is currently working toward achieving the above goals.

IX. ORGANIZATION AND RESPONSIBILITIES

Efficient and successful delivery of bird conservation objectives requires a broad diversity of interested partners, a shared vision of the Plan's goals, a willingness to employ time, energy, money and staff resources to the project, an understanding of each partner's situation and responsibilities to the Initiative, as well as a commitment to the on-going coordination of the Plan.

A goal of the ACJV is to provide a structure and process that attracts partners, leverages and generates funding, and implements projects that support ACJV goals and objectives. At the BCR level, the ACJV's objective is to integrate planning and implementation to more efficiently and effectively meet habitat needs of all birds throughout the flyway and BCRs consistent with all the major continental, national and state bird conservation initiatives.

A. Atlantic Coast Joint Venture

The Atlantic Coast Joint Venture is a partnership focused on the conservation of habitat for native birds in the Atlantic Flyway of the United States from Maine south to Puerto Rico. The joint venture is based on the principles of a strong biological foundation, a landscape approach to conservation, and a strong and diverse partnership. The joint venture is a partnership of the 18 states and commonwealths, key federal and regional habitat conservation agencies, and organizations in the joint venture area. The joint venture was originally formed as a regional partnership focused on the conservation of waterfowl and wetlands under the North American Waterfowl Management Plan in 1988, and has since broadened its focus to the conservation of habitats for all birds, consistent with major national and continental bird conservation plans and NABCI.

At the same time as the North American Waterfowl Management Plan was being implemented, other aspects of bird conservation were evolving and expanding with the completion or maturation of three other continental or national plans – Partners in Flight, U.S. Shorebird Conservation Plan, and the North American Water bird Conservation Plan, as well as a number of national or continental game bird initiatives (e.g. Northern Bobwhite Conservation Initiative, Woodcock Conservation Plan). NABCI evolved in the late 1990s as an effort to provide a framework of integration among these bird plans. The vision of NABCI is “populations and habitats of North America's birds are protected, restored, and enhanced through coordinated efforts at international, national, regional, state, and local levels, guided by sound science and effective management.” The partners associated with these plans and with NABCI have looked to joint ventures as a major way to deliver habitat conservation outlined under the plans. As stated in the NABCI goal: “To deliver the full spectrum of bird conservation through regionally based, biologically driven, landscape-oriented partnerships.” In response to these changes, the ACJV's mission evolved from habitat conservation for waterfowl and wetland-associated species to the conservation of habitats for all birds in the joint venture area - this new and expanded mission was endorsed by the Management Board in 1999.

B. SAMBI and State Working Groups

As part of the expanded mission was the consideration of a new geographic language for integrating among bird conservation initiatives in physiographic regions containing similar habitats— the Bird Conservation Regions (BCRs) adopted by NABCI. Joint venture staff and partners are taking a lead role in planning in these BCRs. There are eight Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture. The South Atlantic Migratory Bird Initiative (SAMBI) was the first such effort undertaken by staff in the ACJV.

The SAMBI Steering Committee is composed of five primary Management Board members from the five states involved in the initiative, and there are numerous technical personnel within each state federal, state, non-governmental organizations or private individuals, that are responsible for the science and biology of this planning effort. These groups are referred to as State Working Groups and are described in a previous section. Partners are responsible for working within the framework of the SAMBI Plan to accomplish common conservation goals for the protection of migratory birds. The framework allows for local and single-species initiatives as well as large-scale protection projects across multiple landscapes affecting multiple species. The State Working Groups are formed by partners interested in achieving the goals and objectives outlined within this Plan for their particular state, and coordinating with other State Working Groups. Technical personnel for the entire effort are interchangeably referred to as the BCR Technical Committee or SAMBI Technical Committee, and members of State Working Groups are included in this larger group.

X. ACCOMPLISHMENTS

The SAMBI Plan’s success extends beyond the projects that have been completed within its region, to all the projects that SAMBI has influenced by creating a model for “all bird” conservation. SAMBI’s accomplishments defy quantitative assessment, as they extend beyond the projects launched by SAMBI planners to any projects that have been influenced or stimulated by the Initiative as a model for “all bird” conservation. Success and accomplishments, in this case, are measured by overall progress towards effective bird conservation for all birds under the framework of NABCI. Although the projects that have been initiated by SAMBI’s planners alone, stand as a testament to the effectiveness of a regionally-based “all bird” conservation initiative, SAMBI’s accomplishments are better measured qualitatively by the strength of the alliances and partners, the ability to remain congruent with other bird planning efforts, and over the overall advancement of the integrated bird conservation.

A. Project Accomplishments

Over all, more than 70 projects have been funded with approximately \$27 million awarded, and partners providing over \$106 million in matching funds. The projects have resulted in over 62,000ha being conserved and protected for all birds within the SAMBI area. SAMBI has well over 200 contributing cash partners, proof of the effective alliances created under SAMBI. Each grant or project was acquired under the North American Wetlands Conservation Act (Standard Grants and Small Grants), National Coastal Wetlands Conservation Grant Program, or the Neotropical Migratory Bird Conservation Act.

The first project, under the Standard Grants Program, was the first “all bird” project under the framework of NABCI by the Atlantic Coast Joint Venture. The SAMBI Habitat Conservation Project, which included North Carolina, South Carolina and Georgia, was a synthesis of 11 projects with 8 partners. The three primary objectives of this project were to 1) restore and manage forested wetlands, including tocsins and Carolina Bays, 2) protect, restore, and manage beach, dune, and inertial habitats, and 3) emphasize year-round management of managed wetlands for shorebirds, waterfowl, and water birds. The project conserved 3,411ha of habitat and its success stimulated the submission of many “all bird” projects in the SAMBI area.

B. Planning Accomplishments

SAMBI is the first integrated conservation planning effort under the framework of the NABCI, lying within NABCI’s BCR 27 of the Southeastern Coastal Plain, coordinated by the Atlantic Coast Joint Venture. SAMBI has been written and implemented with the intent of coordinating a merged comprehensive implementation plan with the East Gulf Coastal Plain Joint Venture, forming an implementation plan for all of BCR 27 ([Figure 2](#)). As the first of its kind in all-bird conservation planning, SAMBI is being used as a model for other regional planning efforts at the BCR level in the ACJV as well as in North America. Some organizations, such as the International Association of Fish and Wildlife Agencies, use components of SAMBI as a template for their own “all bird” workshops.

A website has been developed for SAMBI by the Wildlife Habitat Management Office in Manteo, NC (<http://samigbird.fws.gov/>). The website serves as a valuable tool for land managers and all SAMBI participants as it provides a data entry site for waterfowl, shorebird, and marsh bird surveys, as well as displaying acres managed and shorebird numbers in real time from Florida through North Carolina. This effort is now being coordinated with states from Virginia to Maine, providing a comprehensive real time picture of waterfowl and shorebird populations and habitats being managed in the Atlantic Flyway.

SAMBI is also coordinating the South Carolina Shorebird Habitat Management Group, which consists of a variety of federal, state, and private partners that assist landowners in managing for shorebird habitat during the spring and fall migration.

SAMBI continually proves to be a Plan that reaches beyond its designated borders to achieve its goal of conservation for all birds across all habitats. Often overlooked are the conservation needs of pelagic birds, birds that live in open oceans or seas. SAMBI has pelagic bird component that describes Samba’s goals and plans for this unique group of birds. The pelagic component of SAMBI is integrated into this plan, and a separate document is being written for the conservation of pelagic birds in the southeastern United States.

At this time, SAMBI, staying true to its North American roots, is exploring links with Mexico, the Caribbean, and Latin America. Most recently the American Bird Conservancy, working with the Tri-national NABCI Committee, has identified and linked BCR’s in Canada and the United States with those in Mexico. Bird Conservation Region 27 is one of those, and SAMBI has a distinct link with Mexico in the Yucatan, El Triunfo, and Chamela-Cuixmala with species such as, but not limited to, Chuck-will’s Widow, Wood Thrush, Worm-eating Warbler, Swainson’s Warbler, and Louisiana Waterthrush. It is highly likely that partners in SAMBI will establish relationships with partners in Mexico, Canada, and the Caribbean to address conservation needs for some of these common species. SAMBI planners hope to aid in the conservation projects

created or being created in these areas. SAMBI continues to be a model of adaptive management as planners and partners learn from each other and continually modify and update their conservation practices for the conservation of bird in the Western Hemisphere.

The ACJV and SAMBI partners are also important in species initiatives and task forces addressing the needs of Painted Bunting, Swallow-tailed Kite, and American Oystercatcher.

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