

# South Atlantic Landscape Conservation Cooperative

*Abridged Development and Operations Plan  
December 2009*



## Introduction

The South Atlantic Landscape Conservation Cooperative is one of 22 cooperatives proposed earlier this year by the U.S. Department of Interior to address unprecedented conservation challenges, headlined by climate change.



*Baby loggerhead turtle by Steve Hillebrand*

Landscape Conservation Cooperatives are envisioned as broad partnerships that will provide the science necessary to undertake strategic conservation across large geographic areas. A coordinated national network of these LCCs is the most effective way to address major environmental and human-related factors limiting fish and wildlife populations. The science provided by these partnerships will:

- Inform biological planning and conservation design;
- Help direct assumption-driven research and monitoring; and
- Ensure future conservation decisions are made in an adaptive management framework.

U.S. Department of Interior (DOI) agencies have committed to make the South Atlantic LCC (SALCC) functional in 2010:

- The U.S. Fish and Wildlife Service (Service) will hire a full-time LCC coordinator in late winter and a science position to be determined by need. The Service will also support core science projects useful to all partners involved in the LCC.
- The U.S. Geological Survey (USGS) has committed to develop Southeastern regional science products, and will provide a science position.
- The National Park Service (NPS) has resources at hand to further science capacity.

- Other DOI Bureaus, including Mineral Management Services, Office of Surface Mining, and Bureau of Indian Affairs, are exploring avenues for coordination with the Service's Southeast Region.

In addition, states and universities are exploring ideas for in-kind support, ranging from species climate change sensitivity assessments to GIS technology to sharing office space and staff expertise.

To date, the concept of such a dynamic partnership in the South Atlantic generally has been well received. Many organizations and existing partnerships recognize the need for coordinated efforts across multiple ecological scales to provide needed science.

The Service also is taking the lead in establishing LCCs covering the entire Eastern Seaboard (North Atlantic, South Atlantic, Peninsular Florida LCCs) and the Gulf of Mexico coast (Peninsular Florida, Gulf Coast Plain and Ozarks and the Gulf Coast Prairie LCCs). This geography is among the most sensitive in the world to sea level rise, salt water intrusion, and storm surge among other impacts from accelerated climate change.

### The LCC Challenge: Changing the Business of Conservation So Society Can Meet Unprecedented Demands

One of the grandest achievements of American society has been its public policies and investment in treasured landscapes where citizens are invited to experience natural wonders by hiking, boating, touring, hunting, bird watching, fishing — or simply star-gazing. Many of these wildlife-dependent recreational activities generate significant economic activity in local communities.

And yet society's progress has meant increased pressures on the natural resources we depend on and desire to protect. Accelerating climate change, above all other stresses, threatens to remake landscapes and extinguish species. No longer is it sufficient to protect and manage only pieces of a complex ecosystem, and the conservation community understands that it cannot simply repeat past successes.

Landscape Conservation Cooperatives embody this changing conservation business model. The name itself explains how:

- **Landscape** - LCC boundaries are not intended to be barriers to conservation, but should ensure complete spatial

coverage while avoiding costly duplications. The LCC also should provide common ground for the intense level of coordination required to sustain ecological systems, processes and species.

- **Conservation** - Conservation partners will be able to apply the science-based adaptive management process known as Strategic Habitat Conservation. SHC integrates biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-driven research as an interactive whole.

- **Cooperatives** - Coordination can no longer be our goal. We must recognize the need to work beyond our boundaries and accept interdependency with our partners as an organizing principle.



### Proposed Geographic Area

Within SALCC's proposed boundary is an ecologically diverse region in the southeastern United States that covers portions of six states and approximately 89 million acres.

The boundary was created by a joint USGS and Service team using modified Bird Conservation Regions (BCR). The geographic area is comprised of portions of the Piedmont and Southeastern Coastal Plain BCRs.

The SALCC includes five ecoregions: the Middle Atlantic Coastal Plain, Southern Coastal Plain, Southeastern Plains, the Piedmont, and the Blue Ridge.



Garry Tucker

### *Middle Atlantic Coastal Plain*

The Middle Atlantic Coastal Plain spans approximately 14 million acres and includes coastal areas in Virginia, North Carolina, and South Carolina. This ecoregion is characterized by swamps, marshes, and estuaries. The historic land cover, dominated by longleaf pine, has largely been converted to loblolly and shortleaf pine.

### *Southern Coastal Plain*

The Southern Coastal Plain spans approximately 13 million acres and includes coastal areas in South Carolina, Georgia and Florida. This heterogeneous region includes barrier islands, lagoons, marshes, swampy lowlands, wetlands and numerous lakes. The historic land cover, a variety of forest communities including longleaf pine, slash pine, pond pine, beech, sweetgum, southern magnolia, white oak, and laurel oak, has largely been converted to slash and loblolly pine, oak-gum-cypress forest in low-lying areas, pastures, and urban centers.

### *Southeastern Plains*

The Southeastern Plains spans approximately 26 million acres and includes portions of Virginia, North Carolina, South Carolina, Georgia, and Florida. This ecoregion is characterized by irregular plains. This historic land cover, dominated by longleaf pine, now includes cropland, pasture, and woodlands.

### *Piedmont*

The Piedmont spans approximately 35 million acres and includes portions of Virginia, North Carolina, South Carolina, Georgia, and Alabama. This transitional area between the Appalachian Mountains to the northwest and the coastal plains to the southeast is characterized by moderately dissected plains and hills. The historic land cover, dominated by oak-hickory-pine and Southern mixed forest, has been largely cleared for agriculture and is now rapidly converting to urban and suburban communities.

### *Blue Ridge*

The SALCC will cover only a small portion (approximately 250,000 acres) of the Blue Ridge ecoregion in Virginia and North Carolina. It is likely that the Appalachian LCC will provide the lead for this ecoregion.

### *Southeastern Outer Continental Shelf*

In an area offshore of Cape Hatteras on the Southeastern Outer Continental shelf, two major Atlantic currents mix forming a very rich marine environment. Large mats of *Sargassum* form surface reefs and concentrate rare and endangered seabirds, marine mammals, marine turtles and fish.

### **Starting Point**

The SALCC is an extension of existing, powerful and fully functioning partnerships comprised of federal and state agencies and conservation non-governmental organizations.

### *Eastern North Carolina-Southeastern Virginia Strategic Habitat Conservation Team (ENC-SEVA SHC Team)*

The SALCC has its roots in a national, cross-programmatic initiative launched by Service leaders in June 2004 to develop a landscape-level approach to conservation. The ENC-SEVA SHC Team developed the proposal to establish the SALCC, and remains a strong leader.

### *Atlantic Coast Joint Venture (ACJV)*

The ACJV is a partnership of federal, regional and state agencies and organizations focused on the conservation of habitat for native birds in the Atlantic Flyway from Maine to Puerto Rico.

The joint venture has developed biological planning, conservation design, monitoring and research projects throughout its area. Its partners and staff are willing to play a lead role in helping to establish LCCs in the South Atlantic as well as the North Atlantic, Peninsular Florida, Great Lakes and the Caribbean by building on existing ACJV projects and partnerships including a number of science projects that can serve as initial priorities for the LCCs.

### **Working with Partners**

The ENC-SEVA SHC Team and an SALCC Scoping Team are in place. The teams include representatives from the Service, USGS, NPS, the U.S. Forest Service, Southeastern Association of Fish and Wildlife Agencies' members Georgia, Florida, North and South Carolina and Virginia, the Atlantic Coast Joint Venture, and the Southeastern Aquatic Resources Partnership. Ultimately, top-level representatives from these partner organizations will form the Steering Committee to provide management direction and set the priorities for the SALCC with input from employees and partners.

The Southeast Natural Resources Leadership Group (SNERLG)<sup>1</sup> helped develop the idea for LCCs in 2008 and provided conceptual support in Spring 2009.

The Southeastern Association of Fish and Wildlife Agencies (SEAFWA) presented a session on LCCs and climate change at the 2009 annual meeting in Atlanta.

<sup>1</sup> SNERGL consists of senior regional administrators from the Department of Defense, U.S. Army Corps of Engineers, U.S. Geological Survey, National Park Service, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Agency, Federal Highway Administration, U.S. Forest Service, Environmental Protection Agency and the Tennessee Valley Authority.

## U.S. Fish & Wildlife Service

The Southeast Regional Director also held individual consultations with each State Wildlife Director. There was strong conceptual endorsement.

Future discussions will be held with all partners to ascertain the possible role(s) they are willing to play in the SALCC. In the interim, we include herein the possible roles some partners could play.

In addition, the Service facilitated the development of two teams in the South Atlantic Region to guide and support the formation of the SALCC. The first team is internal to the Service, and has been networking with partners. The second is the SALCC Interagency Scoping Team<sup>2</sup>, which will:

- Provide input and guidance on hiring an LCC coordinator;
- Provide input into choosing a location for core staff;
- Consider other secondary office locations;
- Provide input on developing a Steering Committee, i.e. size, participating



American black duck by Gene Nieminen

<sup>2</sup> Members of the Interagency Scoping Team include Joe DeVivo (NPS), Laurel Barnhill (South Carolina Department of Natural Resources), Sonya Jones (USGS), Brian Branciforte (Florida Fish and Wildlife Conservation Commission), David Whitehurst (Virginia Department of Game and Inland Fisheries), Jason Bulluck (Virginia Department of Conservation and Recreation), Craig Watson (ACJV, USFWS), Mike Harris (Georgia Wildlife Resources Division), Mary Long (USFS), Gordon Meyers (North Carolina Wildlife Resources Commission), Dr. Thomas Eason (Florida Fish and Wildlife Conservation Commission), Roger Pugliese (South Atlantic Fishery Management Council), Scott Robinson (Southeastern Aquatic Resources Partnership), Emily Greene (Atlantic Coastal Fish Habitat Partnership), Dean Carpenter (Albemarle Pamlico National Estuary Program). Staff support: Bob Ford, Amy Keister, Pete Campbell, and Wilson Laney (USFWS).

agencies and organizations and rotation of members.

- Review and comment on this preliminary draft plan for the SALCC.

The Scoping Team also may provide suggestions for the expenditure of funds in the short term, along with a long-term process that matches expenditures with priority needs.

### Current and Potential Partner Roles

#### *Department of Interior U.S. Fish and Wildlife Service (Service)*

The Service is providing leadership and overall coordination, and will contribute to science support, inventory, monitoring, and conservation delivery. The Service has led development of this plan, provided the coordination to form an internal advisory team and provided leadership for the Interagency Scoping Team. The Service has a significant land base consisting of 32 national wildlife refuges in the South Atlantic area. In fiscal year 2010, the Service will fund an SALCC Coordinator and a science position. The Service has coordinated with USGS and NPS staff in the region to ensure the development of shared vision and objectives.

#### *U.S. Geological Survey (USGS)*

The USGS is leading the effort in the Southeastern U.S. to provide the necessary science tools for land managers and planners to address climate change. The USGS, in close partnership with the Service, developed the Southeast Pilot Project, which provides a series of coordinated research products ranging from downscaled climate change predictions to terrestrial and aquatic modeling. The USGS led the development of a plan and vision for the Southeast Regional Climate Impact Response Center (the "Regional Hub") and helped define the conceptual relationship between the regional center and the LCCs.

#### *National Park Service (NPS)*

NPS's Southeast Coast Inventory and Monitoring Network (SECN) has been monitoring the natural resources of parks within the SALCC since 2005. Monitoring methodologies and data management strategies will be shared among LCC partners. Beginning in 2010, the SECN will receive additional base funding to augment its existing monitoring program to assess climate change impacts on park resources in coastal areas.



Black bear by Gary Stolz

#### *Other Bureaus*

Other DOI bureaus have been exploring avenues for coordination including the Minerals Management Service, Office of Surface Mining, and the Bureau of Indian Affairs.

#### *States and the Southeastern Association of State Wildlife Agencies (SEAFWA)*

States that are active in the SALCC will provide essential and foundational support both collectively and as individual states that share priorities through their State Wildlife Action Plans. These states are exploring methods to contribute to the LCC for projects that address shared interstate wildlife priorities. For example, states have extensive data and could share in updating GIS databases in regard to public lands, management status, and potential climate change sensitivity. States also could share in implementation of monitoring programs for a variety of species in a coordinated system.

In addition, SEAFWA continues to offer opportunities for an exchange of ideas about the future of conservation and the role of states, as well as providing opportunity for specific reports, presentations and feedback.

#### *Atlantic Coast Joint Venture (ACJV)*

Joint venture staff and partners will provide leadership for conservation science and delivery.

#### *National Fish Habitat Action Plan partnerships (NFHAP)*

Two Fish Habitat Partnerships overlap the geographic boundary of the SALCC: the Southeast Aquatic Resources Partnership (SARP), and the Atlantic Coastal Fish Habitat Partnership (ACFHP).

### *Partners in Amphibian and Reptile Conservation (PARC)*

PARC is an inclusive partnership dedicated to the conservation of the herpetofauna--reptiles and amphibians--and their habitats. Membership includes representatives from state and federal agencies, conservation organizations, museums, pet trade industry, nature centers, zoos, energy industry, universities, herpetological organizations, research laboratories, forest industries, and environmental consultants. PARC will be able to serve as a focal point for herpetofaunal planning and conservation efforts.

### *Partners in Flight (PIF)*

The central premise of PIF is in close alignment to SALCC: Resources of public and private organizations in North and South America must be combined, coordinated and increased in order to achieve success in conserving bird populations. PIF is anticipated to be a key partner in bird conservation within the SALCC.

### *Southeast Regional Partnership for Planning and Sustainability (SERPPAS)*

State environmental and natural resource officials from across the Southeast partnered with the Department of Defense and other federal agencies in 2005 to form SERPPAS to prevent encroachment around military lands, encourage compatible resource-use decisions, and improve coordination among regions, states, communities, and military services. The region covered by SERPPAS includes the states of North Carolina, South Carolina, Georgia, Alabama, and Florida.

## Priority Species and Habitats

The South Atlantic LCC includes a tremendous diversity of ecosystems. A number of groups reach continental high points of species richness in the Southeast, making the region one of the richest areas in the temperate zone, surpassed only by eastern Asia.

The six states within the SALCC, as noted earlier, have each prepared plans which identify Priority, or Species of Greatest Conservation Need. Some also identified priority habitats as well. The Service's Southeast Region also is working to identify priority species and habitats.

The SALCC partners will ultimately need to identify a process for determining priority species and habitats. In the interim, for the purposes of this planning exercise, we have identified some potential species, habitats and system drivers (Table 1), and some representative species of management concern (Table 2).

## Anticipated Conservation Delivery Mechanisms Related to Priority Species and Habitats

### Background

The LCC's core staff will focus on the development of science-driven decision support tools, so that cooperators can have a common and useful tool for making decisions about delivering the most effective conservation through ecosystem restoration, habitat management, and policy shifts. A myriad of opportunities exist for delivering conservation on the ground and in policy, and each opportunity can uniquely serve the needs of any particular project.

### Cutting-edge tools

Carbon sequestration partnerships with industry and others represent new opportunities for the SALCC. Carbon sequestration allows industry to offset their carbon footprint by mitigating their carbon emissions with replacement of native vegetation in locations that provide the most effective conservation of wildlife. Two examples are:

### *Pocosins*

Pocosins are unique wetlands, also known as southeastern shrub bogs. These peatlands typically have a thick underlying layer of peat soils (Histosols) that act as a chemical sponge over geologic time, locking-up metals, carbon, and nutrients in vegetation and the deepening soil layer.



*Painted bunting by Ty Ivey*

Inundation of hundreds of thousands of acres of low-lying pocosins east of Pocosin Lakes from sea level rise is anticipated; conversion of thousands of acres of low pocosin to marsh in and near Pocosin Lakes is likely.

Restoring peatlands, like those on the Albemarle-Pamlico peninsula, provides an adaptive mechanism to sea level rise. The re-accumulation of soil also helps mitigate the impacts of flooding and storm events while improving water quality, wildlife and vegetation. A 10,000-acre tract is proposed for restoration near Pocosin Lakes NWR. The project also will sequester an estimated annualized average of 10.8 metric tons of CO<sub>2</sub> equivalent per acre per year.

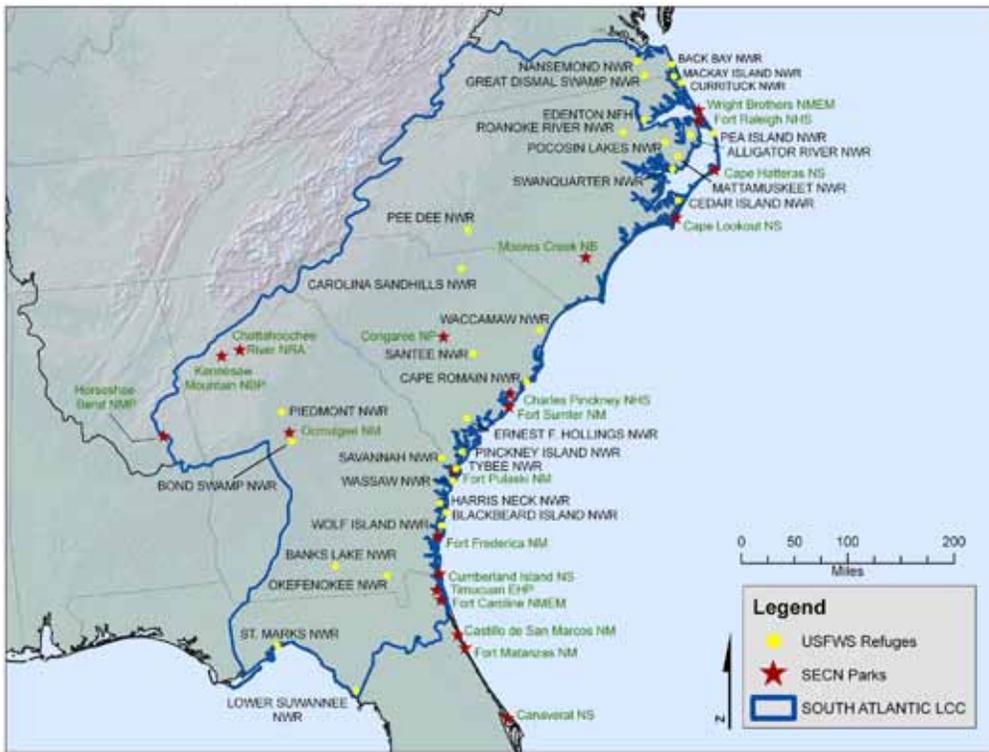
### *Tidal marsh*

In the United States, carbon stored in tidal salt marsh soils comprises 1-2% of the total carbon sink. Each molecule of carbon dioxide sequestered in tidal marsh soils and their tropical equivalents, mangrove swamps, probably has greater value than that stored in any other natural ecosystem due to the lack of production of other greenhouse gases.

Tidal marshes also exhibit low rates of organic matter decomposition, because the anaerobic decomposers of these oxygen-depleted environments operate at slower rates than do their aerobic counterparts of terrestrial environments. Thus, as



*Cypress trees by USFWS*



## Developing Capacity to Support Science Needs

Many projects in this section are partially or fully funded by LCC partners, including the Service's 2010 appropriation. However, exact budget balance and needs remain for projects under development.

### Southeastern U.S. Projects

#### *Southeastern Regional Climate Change Response Center*

The USGS Regional Climate Change Response Centers will work with a variety of partners to provide natural resource managers with tools and information to help them anticipate and adapt conservation planning to climate change. The forecasting products produced by these regional centers will enable fish, wildlife, and land managers to design suitable adaptive management approaches.

The SE Pilot Project will begin to develop regional downscaled climate models, land cover change products, regional ecological models, regional watershed models, a web-based portal for information exchange, and other science tools. Models and data produced by the SE Pilot Project will be used in a collaborative process between USGS, LCCs, state and federal partners, NGOs and academia to produce science at appropriate scales to answer resource management questions.

Estimated cost: \$1.2M is anticipated for FY 2010

#### *Downscaling Global Circulation Models for Southeastern Application to Conservation*

A Geodata Portal will be created to support the regional Climate Change Response Center and LCCs. The portal will be a web-delivered computer application for discovery, selection, extraction, processing, quality control, and formatting of spatio-temporal data for ecosystem modeling applications. The purpose is to bring modelers, data providers, and resource managers together in a common framework.

The initial version will support users in assessing the impacts of climate change on ecosystems in the Southeast, with the intent of eventually supporting national studies. The initial version also will support web-based access to climate change data in point and gridded form, and support the loose coupling of models developed for the SE Pilot Project.

seas rise and encroach upon the land, rates of carbon sequestration in coastal marsh soils rise right along with them. A carbon sequestration habitat restoration project near Waccamaw NWR is under development.

#### **Traditional tools**

As the SALCC partnership matures, appropriate landscape-level approaches for priority species and/or their habitats, and designs will be provided to partners with the most effective delivery mechanisms and programs for their implementation.

For aquatic species and habitats, these include:

- Restoration of water quality through maintenance of riparian corridors;
- Implementation of best management practices on agricultural, industrial forest and urban landscapes;
- Wetlands protection, conservation and restoration;
- Special designations such as Primary Nursery Area (PNA), Habitat Area of Particular Concern (HAPC), Essential Fish Habitat (EFH), and Critical Habitat designation;
- Habitat Conservation Plan (HCP) development;
- Captive propagation and release;

- Reconnecting fragmented habitats through barrier removal or provision of fishways; and

- Development of fishery management plans.

For terrestrial ecosystems, these include:

- Acquisition of significant habitats;
- Forest restoration through carbon sequestration;
- Restoration of riparian corridors; and
- Best management practices to promote habitat and species diversity in urban, agricultural and industrial forest habitats.



*Red bay by USFWS/Dale Switer*

**Table 1. Habitats found within the South Atlantic LCC.**

Habitat and Systems
Bottomland and Floodplain Forests
Glades, Barrens, and Prairies
Longleaf Pines and Southeastern Pinelands
Carolina Bays
Pocosins
Atlantic White-Cedar Swamps
Barrier Island Communities and Maritime Forests
Rivers and Streams
Caves
Estuaries
Oceans
Salt Marshes and Wetlands

Estimated cost: \$150,000

*Policy linkages between science and land conservation and management programs*

We need to pursue conservation at landscape scales as a science-based, socially-driven endeavor. Doing so will require we lay before the public transparent, science-based assessments of population and habitat sustainability to find conservation solutions that will lead to socially viable populations of fish and wildlife. This initiative will link conservation science to conservation delivery via effective policy and incentive programs.

Estimated cost: \$80,000

**The Development of Tools for the SALCC Conservation Community**

*Designing Sustainable Landscapes in the Southeastern United States*

A high priority project which would benefit multiple partners is the expansion



*Gopher tortoise by USFWS*

of the Designing Sustainable Landscapes Pilot Project for bird populations in the Eastern U.S. The pilot project, which is scheduled to be completed in 2010, focuses on bird species in the Southeastern Coastal Plain portion of the SALCC area. The overall objective of the pilot is to develop a consistent methodology and to enhance the capacity of states, joint ventures and other partners to assess and design sustainable landscape conservation for birds and other wildlife in the eastern United States.

Expanding this project includes the development of core landscape projection datasets for the Piedmont Region, including projections of climate change, urbanization, ecosystem disturbance processes, and land cover dynamics. It will also include expanding the stakeholder-driven process to identify priority species and evaluate available science to create species-habitat relationship models.

Estimated cost: \$174,000

*Information Management*

A primary role of the LCC is to collect, organize, and make available natural resource data and to contribute to each partner's institutional knowledge by facilitating the transformation of data into information through analysis, synthesis, and modeling. To meet these objectives, the SALCC will develop a decision support system that effectively stores, maintains, analyzes, and distributes the data, information and products conducted by each partner agency.

A pilot project to develop linkages and partnerships is proposed for fiscal year 2010 called Integrated Nesting Shorebird and Sea Turtle Data Management System. Working with partners at NPS, states, national wildlife refuges and others, the SALCC would develop a single data management system capable of managing and reporting out nesting shorebird and sea turtle data. The system would be based on existing efforts and would be designed to allow all partner agencies to efficiently enter, access, analyze, and report target species data at the local to landscape level for research, management, and planning for the conservation of priority species across multiple LCCs.

Estimated cost: \$180,000



*Red-cockaded woodpecker by Jim Hanula*

*Water Availability for Ecological Needs*

This component of the Southeastern Integrated Assessment will develop information and modeling approaches to help resource managers assess potential effects of climate change on biological resources. The specific focus of this research is on aquatic biota, especially freshwater fishes and mussels, and on improving our ability to answer questions concerning how species are likely to respond to climate-induced hydrologic change.

Estimated cost: Most of this project is supported by USGS; an additional \$40,000 is needed.

*Identifying Coastal Habitats at Risk – Gulf and South Atlantic Coasts*

In partnership with the Gulf Coastal Plain and Ozarks LCC, the SALCC will support science tools that assess sea level rise impacts on the Gulf Coast. The southeastern region ranks highest in the number of U.S. billion-dollar, weather-related disasters and flood insurance claims. The Gulf of Mexico coastal zone is already experiencing some of the highest rates of coastal erosion and wetland loss in the world. The high vulnerability of this low-lying coastal zone to land loss and flooding is generally attributed to the combined effects of human development activity, sea-level rise, hurricanes and other tropical storms, and a natural physical setting that is sensitive to subtle changes in the balance of marine, coastal, and onshore processes.

**Table 2. Representative species of management concern to LCC partners**

*Fish*

American Shad  
Blueback Herring  
Lionfish  
Robust Redhorse

*Mammals*

Northern Right Whale  
White-Tailed Deer  
Black Bear  
Southeastern Beach Mice (all subspecies)  
Indiana Bat

*Reptiles and Amphibians*

Gopher Tortoise  
Loggerhead, Green, Leatherback, and Kemp's Ridley Sea Turtles  
Eastern Diamondback Rattlesnake

*Plants*

Venus Flytrap  
Red Bay  
Sea Beach Amaranth

*Birds*

Red Cockaded Woodpecker  
Swainson's Warbler

*Invertebrates*

Freshwater Mussels  
Green Mussel  
Palamedes Swallowtail  
Carolina Heelsplitter  
St. Francis Satyr

This project is currently supported through the USGS SE Pilot Project for the coastal zones of Mississippi and Alabama, which are in the Gulf Coastal Plain and Ozarks LCC. As part of a cooperative effort between LCCs, the South Atlantic LCC will explore opportunities to continue this project into the Florida Panhandle, and extend past the mouth of the ACF basin.

Estimated cost: \$135,000 to add Florida Panhandle to Gulf Coast Assessment and \$300,000 to add SALCC to Mid and North Atlantic sea-level rise modeling for marshes.

*Template for Strategic Habitat Conservation (SHC) implementation plan to meet Waterbird Management Needs within Atlantic and Mississippi Flyways*

In partnership with LCCs across the eastern U.S., the SALCC will implement an integrated waterbird monitoring and management program to inform decision makers and resource managers in an adaptive management context. Improved

resource contributions toward waterfowl, shorebirds and waterbirds may be realized by this cross-scale integration of management actions across multiple spatial scales from the Flyway scaled down to local wetland management sites.

Presently, little coordination occurs among management sites, resulting in many disparate efforts that may not meet all waterbird needs at the appropriate spatial or temporal scales. Additionally, management decisions are often made in the absence of supporting monitoring information. The application of consistent monitoring protocols across spatial scales that informs management decisions will increase the collective contribution of wetland management actions to meet waterbird habitat needs.

Estimated costs: \$150,000

**Staff Capacity**

Conservation efforts to address unprecedented threats will require new organizational core competencies that interact with existing capacity. The competency needs are:

- Assessing and predicting population and habitat sustainability within ecologically definable units;
- Spatially depicting goals and objectives that reflect measurable biological outcomes; and
- Assessing and characterizing the environmental sensitivity of landscapes to species and populations.

Resources are available within DOI to start development of the core competencies that can complement and build upon efforts of existing capacity. For the South Atlantic, the Service will fund an LCC coordinator, a science coordinator, a part time administrative assistant, office space, two vehicles and computer support. Negotiations are underway for partnership sharing of these costs, such as office space. Increased capacity from USGS is tentatively set for one scientist with possible costs similar to the above estimates.



Wood storks at ACE Basin NWR by USFWS

Estimated costs: \$540,000

*LCC Coordinator*

This position has three primary components: oversight of conservation science development for the LCC, partnership development and support, and developing and implementing appropriate multi-organizational conservation strategies.

*Science Technology Coordinator*

This position is responsible for coordinating science for the full spectrum of priority aquatic and terrestrial species, including population-habitat modeling, simulation modeling, development of decision support tools, monitoring, and research. This position's primary responsibilities will be to prepare proposals, secure funding, and oversee and implement projects to develop relevant models and decision support tools needed to formulate objectives and priority actions, and to continually test the assumptions behind them.

*Science*

The science coordinator would develop a science program and specific research projects in support of LCC needs, as defined by the core staff and Steering Committee. During FY 2010, the USGS, the Service and others will identify key conservation issues related to potential landscape change and needs associated with implementation of the first eight LCCs. Assessment of needs at the level of individual LCCs, and identification of challenges common to multiple LCCs (requiring larger joint efforts), are both important.

## Science

New monies to be programmed for climate change monitoring are intended to be applied within the context of the SALCC.

## Spatial Analyst

The Service will dedicate staff time in the interim.

## Out-year positions

Out-year needs include the following possible positions. Gaining this expertise, as well as definition of other needs within the LCC, will be an ongoing, high priority function of the LCC Steering Committee.

- Fisheries/Aquatics Scientist
- Ecosystem Simulation Modeler
- Population-Habitat Modeler
- Coastal/Marine Scientist
- Hydrologist

## Top Science Needs Exceeding the Initial Regional Allocation

The implementation of specific, thematic research can help managers and land planners understand impacts on natural landscapes. Habitat impacts are driven by a variety of factors, including climate change and sea level rise, increased urban development, the spread of invasive species, and the ongoing cumulative impact associated with fragmentation of wildlife corridors. As an example, habitats in the coastal plain are increasingly impacted by rapid urban development. Coastal habitats that are influenced by the tides are subject to losses due to accelerated coastal erosion, submergence of barrier islands and low-lying coastal habitats, dissection of salt marsh due to sea level rise, impacts on coastal dune formations following extreme storm events, and the conversion of freshwater marshes and wetlands due to saltwater intrusion.

An array of research is needed to develop models and monitoring protocols to evaluate the potential effects of climate change and sea level rise on wildlife



American shad by Duane Raver

## Conservation Lands in the SALCC



populations and habitats. Results and recommendations will be used to facilitate management decisions to minimize or mitigate impacts both on local and regional scales.

The ability to identify changes in habitats across the landscape over time will help land managers address the impacts with strategies that are holistic in nature, on a landscape scale, with a view toward ensuring that migration corridors remain intact, protected landscapes for high priority species continue function, and viable ecosystems are in place and protected for Federal Trust species.

These projects are not in priority order.

### Examples of Research Needs

*Assessing Longleaf Pine Ecosystems*  
Estimated cost: \$150,000

*Measuring Hydrological Conditions*  
Estimated cost: Installment of one well: \$11,000; yearly O&M costs \$6,000

*Hierarchical Landscape Models for Endemic Unionid Mussels: Building Strategic Habitat Conservation Tools for Mussel Recovery in the South Atlantic Landscape Conservation Cooperative.*  
Estimated cost: \$365,000

*Population Status for Four Threatened and Endangered Freshwater Mussels in the Ochlockonee River Basin*  
Estimated cost: \$120,000

*Develop Historic Rate of Change Models for Coastal Barrier Islands*  
Estimated cost: \$250,000

*Improve Land Managers Access to Current Body of Science*  
Estimated cost: \$10,000

*SALCC Inventory and Monitoring System*  
Estimated cost: \$200,000

*Carbon Sequestration Studies*  
Estimated cost: \$150,000

*Climate Change Impacts of Forest Dynamics*  
Estimated cost: \$50,000

*Assessment of Habitat of the Flatwoods Salamander*  
Estimated cost: \$380,000

*Assess health and status of Bottomland Hardwood Forests in the South Atlantic*  
Estimated cost: \$60,000

*Expansion of Blueback Herring and American Shad Habitat Models for use in the North Atlantic LCC and the SALCC*

*Demonstrate How to Manage Flow for the Benefit of Ecological Systems and Human Needs*

*Characterizing Basic Units of Conservation*

*Distribution and Habitat Use of Keystone Species, including Northern Right Whales, in the Nearshore Atlantic Ocean*

## Anticipated Successes in 2010

### Partnership and Staff Development

We expect to have a fully functional Steering Committee in place that guides the conservation science and priority conservation delivery mechanisms in the South Atlantic. To manage against — and with — threats caused by accelerating climate change, we expect the Steering Committee to embrace new challenges in conservation for the 21<sup>st</sup> Century. That likely will mean acquiring new technologies in information management and spatial analysis and developing non-traditional expertise in core staff, such as conservation biology and land-use policy. We expect members of this Steering Committee to be leaders in the conservation effort in the South Atlantic, and reach out to traditional and non-traditional partners for the use and development of science products and conservation delivery.

## Biological Foundation

The basic elements of conservation depend on a biologist's knowledge of species, species-habitat relationships and ecosystem function. Based on high priority needs expressed in this proposal, we expect substantial progress and success in learning more about the life history traits of high priority species in the South Atlantic, including those off shore.

The biological planning work for birds in the South Atlantic Coastal Plain will be expanded to the Southern Piedmont by partners working through the Atlantic Coast Joint Venture and South Atlantic Migratory Bird Initiative in preparation for conservation design work in that area. In addition, we expect the development of a process with stakeholders in the LCC model that determines species sensitivity to different climate change scenarios.



*Piping plover by Gene Nieminen*

## Conservation Design

The development of tools to design conservation and sustainable landscapes will happen at multiple spatial scales. We expect to have success in the development of downscaled General Circulation Models, and the easy access to that information by scientists. We expect successful and significant progress in the development of models that predict and manage for coastal vulnerability with climate change on the Gulf Coast side of the SALCC. We expect the completion of spatial analysis for the coastal zone of the South Atlantic (part of the Designing Sustainable Landscapes project).

## Conservation Delivery

We expect the start of a successful model demonstration of conservation delivery in the restoration of a 10,000 acre tract of pocosin wetlands in North Carolina using carbon sequestration as the restoration/conservation delivery tool. This project is

in partnership with industry and others who need to offset their carbon footprint, and are willing to do so by the restoration of this high priority tract of pocosin wetlands. The Service will manage strictly for wildlife and ecological benefit, while industry can mitigate carbon emissions.

## Inventory and Monitoring

We expect to demonstrate success in integration with the NPS, USGS and the Service in survey methods, objectives, and data compatibility. We expect to complete initial steps on the Atlantic Flyway Integrated Waterbird Management and Monitoring Project, including model development and testing and protocol development.

## Assumption-Driven Research

The development of research priorities that are driven by assumptions in modeling and management requires time to consider the effectiveness of those models and management decisions. While the SALCC will support several integrated research projects, many of which are designed to test basic assumptions, we expect our success in this year to be the development of a process by which we can thoroughly tease out the most important assumptions in models and management.

## Information Sharing and Adaptive Management

We expect a successful demonstration project that integrates data from multiple sources to examine sea turtle and shorebird response to accelerating beach erosion. We hope to establish the basis for long term linkages among data and to establish a process of information management that can feed into management decisions at several spatial scales.

## Unique Characteristics

The SALCC supports numerous unique habitats and species which occur nowhere else on the planet. It provides unique



*Beach erosion by Steve Hillebrand*

ecosystem functions which are vital for sustaining migratory species of avifauna, anadromous and pelagic fish, marine mammals and sea turtles. The Region is subject to intense demographic pressure from a burgeoning human population and climate-change induced sea level rise, more so than many other parts of North America.

Habitats within the SALCC support species traveling in the vast migration pathway known as the Atlantic Flyway. In the southern portion of the Atlantic Flyway the route narrows considerably in the five coastal states that comprise the SALCC: Virginia, North Carolina, South Carolina, Georgia, and Florida. It is this narrowing of the route that effectively concentrates and increases the number of birds and other species found in any one location in the SALCC.

Large concentrations of waterfowl, shorebirds, neotropical migrants, and raptors, along with some species of bats, dragonflies, and butterflies use this pathway during migration events. Of those groups, shorebirds are in greatest decline. At least half of all coastally migrating shorebirds have declined by at least 39 per cent. They face threats from pollution, over-fishing, and warming sea



*Carolina heelsplitter by USFWS*

temperatures caused by climate change, as well as threats at island and coastal nesting sites. Sea level rise will inundate their habitats.

The SALCC also is known for a second vital species migration corridor, which we proposed to name the Atlantic Seaway. The marine portion of the SALCC, from the beach to 200 miles offshore, includes both pelagic and nearshore migration routes off the Atlantic Coast, and many of the species that use this route rely upon the SALCC's salt marsh, estuarine systems, coastal wetlands, and other habitats along that oceanic pathway for food, resting, and breeding. The SALCC's great expanses of salt marsh along the Atlantic Coast are known as some of the most productive ecosystems on earth. Salt marsh habitats provide a source of food for estuarine species as well as for the pelagic species that migrate along the off-shore corridor of the Atlantic Ocean. Salt marsh ecosystems with their rich tidal creeks and diverse estuaries also support the crab, shrimp, and oyster industries, and commercial fisheries, along with the birds, fish, and turtles that migrate along the coast each year.

The exclusively oceanic pelagic route extends from Labrador and Nova Scotia to the Lesser Antilles, and on to the mainland of South America. The pelagic migration paths are traveled by thousands of water birds and shore birds, marine mammals (bottlenose dolphins, humpback whales, northern right whales), bluefin tuna, dolphin-fish, wahoo, yellowfin tuna, swordfish, Atlantic sturgeon, migratory striped bass, spiny dogfish, weakfish, and the loggerhead and leatherback sea turtles.

In addition to these two unique migratory pathways, the SALCC also hosts numerous endemic species and habitats which are again restricted to it alone. Many endangered, threatened, and declining species are dependent upon these habitats, including the loggerhead sea turtle, wood stork, red-cockaded woodpecker, and piping plover. The SALCC's coastal and estuarine habitats support crab, shrimp, and oyster industries, while the region's abundant wetlands and forests sustain small and large game species, recreational fisheries, and a diversity of unique and rare habitats of national and international importance.

Mature southern pine forests, including the longleaf pine ecosystem are home for many species of eastern forest birds

that are currently suffering consistent and troubling declines. Red-cockaded Woodpecker, Brown-headed Nuthatch, and Bachman's Sparrow, year-round residents of mature southern pine forests, are especially impacted. Many eastern forest birds are suffering consistent and troubling declines, including neotropical migrants that require large blocks of intact forest, such as the Kentucky Warbler, Wood Thrush, and Eastern Wood-Pewee. Likewise, species dependent on disturbed or early successional forest or natural disturbance (including pine barrens) such as the Golden-winged Warbler, Whip-poor-will, Prairie Warbler, Eastern Towhee, and Field Sparrow, and popular game species such as Northern Bobwhite and American Woodcock are at risk.

The SALCC's contribution to entire populations of migratory birds, bats, and butterflies not only affects species diversity in the U.S., it also affects species diversity in Canada and other countries because the U.S. shares many bird species with other countries along the pathway.

### Additional LCC Support from the Service's Southeast Region in FY 2010

The Service has taken a strong lead to start development of LCCs that cover the entire eastern seaboard (North Atlantic, South Atlantic, Peninsular Florida LCCs) as well as much of the Gulf of Mexico coastal (Peninsular Florida and Gulf Coastal Plain and Ozarks LCCs). This geography is among the most sensitive in the world to sea level rise, salt water intrusion, and storm surge from accelerated climate change. The interaction among these LCCs is important, and is demonstrated in this plan.

#### Gulf Coastal Plain and Ozarks LCC

The Service's Southeast Region (Region 4) will support the start up functions of the Gulf Coastal Plain and Ozarks LCC in federal fiscal year 2010, in partnership with members of the Lower Mississippi Valley, East Gulf Coastal Plain, and Central Hardwoods Joint Venture Management Boards. Regions 2 and 3 will be heavily engaged as well. The Lower Mississippi Valley Joint Venture Board agreed to provide a strong leadership role in the development of the LCC. A concept plan, to be drafted at the same time as this plan (December 2009) is complete and develops actions for 2010 LCC development.

#### Peninsular Florida LCC

Region 4 will support the development of the Peninsular Florida LCC in federal fiscal year 2010, in strong partnership with the NPS, USGS, the state of Florida and others. The development of the Peninsular Florida plan will be completed by spring 2010, and a staff will be provided on detail for the LCC to begin a higher level of conservation planning and to initiate or sustain high priority science projects.



*White-tailed deer by Steve Hillebrand*

#### Cooperation with the North Atlantic LCC

A portion of the SALCC lies in southern Virginia, which is part of the Northeast Region (Region 5). The two regions already coordinate on topics of mutual concern through the Atlantic Coast Joint Venture and Atlantic Coastal Fish Habitat Partnership, whose boundaries include both LCCs. These partnerships can serve as conduits for coordination. Region 5 has offered to continue to provide significant support to program offices in the SALCC in a coordinated effort to most effectively and efficiently conserve migratory birds and other trust resources common to these congruent geographic areas.

#### Cooperation with the Appalachian Mountains LCC

Although the South Atlantic LCC is targeted for full implementation in 2010, Region 4 also has great interest in initiating an LCC for the Appalachian area. Region 5 will be the lead for the Appalachian Mountains LCC and will coordinate closely with the Southeast and Midwest Regions on development. With existing partnerships, projects, and Service offices moving forward with landscape-scale planning, this LCC has the opportunity to start immediately to build biological planning and conservation design capacity that complements existing efforts, host partner meetings, and develop contracts in FY 2010.