

U.S. Fish & Wildlife Service

2011 South Florida Conservation Report



From Our Field Supervisor: **Our Common History, Our Common Future**

Our work to address environmental contaminants in south Florida, recover imperiled species, restore coastal habitats and develop landscape conservation approaches through our regulatory tools is a key part of broader efforts to conserve south Florida's natural heritage.

The U.S. Fish and Wildlife Service has a rich conservation history in south Florida. President Theodore Roosevelt created Pelican Island National Wildlife Refuge in 1903, the first refuge in our country and a cornerstone of today's world-renowned refuge system. Our ecological services office has been a central part of south Florida conservation for over half a century and was one of the first offices of its kind.

Water infrastructure projects in the 20th Century had significant unintended negative consequences, causing dramatic declines in bird life and a downward spiral in the health of the ecosystem. Habitat loss from development and the damage from invasive species such as melaleuca, Brazilian pepper and Old World climbing fern took a toll on our environment and continue to have a negative impact. More recently, invasive reptiles like the Burmese python have further complicated our conservation mission.

While these threats were emerging during the 20th Century, another change was occurring. People saw the decline of our environment and demanded conservation. Government agencies, farmers, ranchers, environmental organizations and others set differences aside and rethought water infrastructure.

This diverse array of partners spoke with one voice and convinced the country to try something new: restoration at the ecosystem scale with a cost of billions and a time horizon of decades. The partnership culminated in the Water Resources Act of 2000, which officially launched the Comprehensive Everglades Restoration Plan.

We have now reached a pivotal point in the history of Everglades restoration: from planning to turning dirt. We broke ground on a 1-mile bridge along the Tamiami Trail to begin restoring water flow. We launched an important next phase of the Picayune Strand Restoration project to benefit panthers, many other

species and estuaries to the south. We have begun the C-111 Spreader Canal Project to rehydrate Taylor Slough in Everglades National Park. We have started the important work needed to restore Biscayne Bay. Ground was broken on the Site 1 Impoundment Project, which will provide water storage considered essential to restoring the Everglades' health and viability. Ground was also broken on the Faka Union canal pump station at the Picayune Strand. More projects are needed and on the way. Restoration is the best hope we have for recovery of some of our most endangered birds.

Our work to address environmental contaminants in south Florida, recover imperiled species, restore coastal habitats and develop landscape conservation approaches through our regulatory tools is a key part of broader efforts to conserve south Florida's natural heritage. The relationships we have built are our conservation force multiplier, helping to bring as many tools to the table as possible and to achieve the greatest potential benefits for our trust resources.

These tools are extremely important as we tackle the challenge of climate change, the transformational conservation question of our time. In this adversity is opportunity. We can rewrite the conservation playbook, envision what the future will bring and force ourselves to ask how the decisions of today will stand up to the conditions of tomorrow.

This is an exciting time to work in conservation. We have a unique opportunity to restore an ecosystem, recover imperiled species and help lead the transformation of conservation policy required in the face of climate change. We have much to be proud of in south Florida, but our work has only begun.



Paul Souza, Field Supervisor South Florida Ecological Services Field Office, credit Denise Ritchie.

Front cover photo: a Florida scrub-jay prepares to explore its habitat, credit Vince Lamb.

A Landscape Conservation Cooperative in Peninsular Florida

Strategic Habitat Conservation (SHC) is a science-based framework for making management decisions about where and how to deliver conservation efficiently to achieve specific biological outcomes.

We're talking with many partners to create shared conservation priorities and a Landscape Conservation Cooperative (LCC) to realize this vision.

SHC is a way of thinking and of doing business that requires us to set specific biological goals, allows us to make strategic decisions about our work, and encourages us to constantly reassess and improve our actions. We have an increasingly urgent need to embrace a strategic approach due to a rapidly changing world. Fortunately, SHC is alive and well in south Florida. Its five basic elements are:

- Setting Targets – Biological Planning;
- Developing a Plan to Meet the Goals – Conservation Design;
- Implementing the Plan – Conservation Delivery;
- Measuring Success and Managing Adaptively – Outcome-Based Monitoring; and
- The Iterative Process of Improving – Assumption-Based Research.

One of the most ambitious restoration projects in the world is underway right here in south Florida. The Comprehensive Everglades Restoration Plan will help return many of the ecosystem functions of the past and help populations of imperiled species rebound.

A science and monitoring program required under Everglades restoration — the Monitoring and Assessment Plan — will inform adaptive management and help us know when we've met biological targets.

We're fortunate in peninsular Florida to have many forward thinking partners such as the Florida Fish and Wildlife Conservation Commission who have already led a broad public dialogue on shared responsibilities. This LCC would build upon the work that has been accomplished by many partners to date.

A network of partnerships within the Department of the Interior and beyond is answering key scientific questions such as “How much flow do we need to restore the Everglades?” and “How can we conserve populations of species to ensure they can reap the benefits of restoration when it is accomplished?”

Many facets of SHC are showcased in this conservation report. One example is the Picayune Strand Restoration Project, a 55,000-acre, crown jewel restoration project that will benefit the Florida panther and other species.

Another example is the statewide habitat conservation plan for sea turtles and coastal habitat we're developing with partners across Florida. The innovative use of conservation banking to strategically locate, acquire and manage important habitat for imperiled species is one more.

Our challenge is to take SHC to the next level through the creation of an LCC, which will help us set conservation priorities with our diverse array of partners, target the greatest needs and improve results on the ground.



An egret catches rays from the rising sun, credit Jessie Dickinson.

Climate Change

Florida is feeling the effects of global warming. We are reviewing current science on climate change factors such as increasing temperature, changing rainfall patterns and sea level rise when evaluating activities in south Florida that affect listed species and their habitats.

Our actions to date include:

- developing a temperature model;
- monitoring indicators of climate change;
- focusing on conserving priority species;
- developing partnerships with traditional and untraditional partners;
- implementing proactive land conservation efforts (leverage partners to acquire habitat);
- monitoring shifting shorelines (habitat changes that affect coastal species); and
- implementing teleworking and using hybrid vehicles for office staff (to reduce the office's carbon footprint).



Manatees like this one could be adversely affected by climate change. As sea level rises and is accompanied by other impacts to water quality, the seagrasses manatees rely on as a primary food source will likely be negatively impacted. Rising sea levels may also cause saltwater intrusion into freshwater aquifers and coastal waters that provide freshwater vegetation and drinking water for manatees, credit Larry Linton.

We're working with the Massachusetts Institute of Technology (MIT) and the U.S. Geological Survey (USGS) to develop regional-scale "alternative futures" that spatially simulate likely climatic, hydrologic and land use conditions in the decades ahead.

The collaboration will examine the impacts of such changes on animals and plants and their habitats in the Everglades and Florida Keys ecosystems. Possible impacts to south Florida's vulnerable national wildlife refuges will be a key focus in our assessment work with MIT and USGS.

Major outputs of the study will include data that characterizes the potential impacts on the Everglades from climate change and will provide needed information for strategic habitat conservation planning efforts in south Florida.

Florida Panthers: A Priority Focus



A Florida panther walks along a trail in a wooded area in southwest Florida, credit David Shindle.

By any measure, recovering the Florida panther is one of the most significant conservation challenges in the United States today. This species that once roamed the landscape from Louisiana to South Carolina now has a breeding population only in south Florida. It currently occupies less than five percent of its former range.

The panther's recovery is especially complicated when you consider the dramatic rate of growth in Florida over the past decade. Obstacles to its recovery include habitat loss, the reduced genetic diversity that often plagues small populations, the potential for disease outbreaks and vehicular collisions on south Florida's roads.

In December 2008 we released a final plan designed to recover this imperiled

species. That plan represents the collective effort of the 42-member Florida Panther Recovery Team composed of many partners including the Florida Fish and Wildlife Conservation Commission, other state agencies both in Florida and throughout the southeast, Native American tribes, the National Park Service, environmental organizations and many more.

This is the third revision to the original plan adopted in 1981 and last revised in 1995. This plan's focus is on sound science. All new scientific information generated in the last decade and all identified actions needed to recover the species were collected, analyzed and discussed.

One of the plan's greatest strengths is the emphasis on outreach, education and collaboration.

Recovery will require partnerships, the tireless work of many and a long-term commitment.

We and our partners must continue to work together to conserve habitat, carefully monitor genetic integrity, build highway crossings to allow safe passage and encourage everyone in Florida to contribute.

While the challenges are daunting, we also have some success stories to share and reason for hope.

By the early 1990s, when the panther population was only 20 to 30 animals, it became clear genetic problems were a key factor in a downward spiral that would likely lead to extinction.

The Florida Fish and Wildlife Conservation Commission led a genetic restoration effort that helped trigger a population rebound. In addition, the establishment of Big Cypress National Preserve and the Florida Panther National Wildlife Refuge, along with the state's wildlife management areas and parks, helped sustain this increase.

The highest conservation priority must be protecting the existing population in south Florida. Efforts are underway to address this need. Partnerships with ranchers are a cornerstone of panther conservation.

The Picayune Strand Restoration Project will restore 55,000 acres of some of the most important Florida panther habitat. Conservation banking promises to protect thousands more. Local initiatives such as Collier County's Rural Lands Stewardship Plan could add a major contribution. Much has been done, but much more and harder work remains.

Everglades Restoration

The South Florida Ecological Services Office is prominent in every aspect of Everglades restoration, including providing expert advice on managing fish, wildlife and plants for projects designed to help reconnect and restore natural flows to the historical Everglades.

The Comprehensive Everglades Restoration Plan (CERP) includes dozens of integrated water management projects to restore south Florida natural ecosystems, while providing other water-related needs — including water supply and flood control — through 2050, across 13 million acres.

Many of these projects are well into the planning process and some have broken ground. We assisted in completing the Biscayne Bay Coastal Wetlands Project Implementation Report and the first project-specific Adaptive Management Plan. These actions will benefit wetlands and estuarine resources in Biscayne Bay. We have completed a biological consultation on the Melaleuca Eradication and Other Exotic Plants Project, which focused on the mass rearing and release of biological control agents (insects) targeting melaleuca, Brazilian pepper,

Old World climbing fern and Australian pine that threaten the Everglades ecosystem.

We also provided technical assistance to the development of the C-111 spreader canal, Decompartmentalization and Sheet Flow Enhancement Project, Tamiami Trail Bridge, Picayune Strand restoration, Southwest Florida Feasibility Study and Compartments B and C projects, among others.

We consulted with the State of Florida to develop the first water reservation for fish and wildlife resources associated with the Picayune Strand Restoration Project.

We also assisted the South Florida Water Management District (District) in the redesign of the Lakeside Ranch Stormwater Treatment Area (STA) to avoid two active bald eagle nests.



A group of wood storks enjoy Florida wetlands, credit South Florida Water Management District.

Although no longer federally listed under the Endangered Species Act, bald eagles are still protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.

The redesigned project will conserve a 280-acre natural area (containing the bald eagle nest trees) that will be surrounded by 2,100 acres of treatment marshes. These marshes will treat phosphorus-laden runoff before reaching Lake Okeechobee.

In addition, we chaired and supported Restoration Coordination and Verification's (RECOVER's) assessment team, evaluation team, numerous sub-teams and the RECOVER Leadership Group. Significant accomplishments by RECOVER included a system status update, drafting of an Adaptive Management Manual, project level reviews and development of performance measures.

We worked closely with the U.S. Army Corps of Engineers and the District to develop wildlife-friendly reservoir designs. We also collaborated with partners and academia to integrate the best available science on Everglade snail kites and apple snails, the bird's primary food source, to improve water management strategies for Water Conservation Area 3A. This provides benefits for three species while meeting water supply and flood protection needs.

Conserving migratory birds is among our priorities. Our office developed an innovative Avian Protection Plan (APP) with the District. The APP evaluates options for a range of potential water quality and flood control scenarios for six STAs located in the Everglades Agricultural Area. The APP's intent is to optimize water quality and maintain minimum water levels when practical to avoid flooding nests, and conduct frequent field surveys to see which STA flow ways could be operated to benefit different species.



Researcher James Dwyer and Service biologist Steve Schubert evaluate a caracara's transmitter before releasing the bird, credit Lisa Kreiger.

We are also providing technical assistance to the District on its River of Grass Initiative, which is set to purchase thousands of acres of land where future storage and STAs could be located. This will improve the ability to restore the greater Everglades.

U.S. Sugar Corporation Lands and Contaminant Remediation



The sun rises over Florida wetlands, credit South Florida Water Management District.

We worked with the South Florida Water Management District (District) and Florida Department of Environmental Protection (DEP) to review lands owned by the U.S. Sugar Corporation (USSC) and proposed for purchase for use in Everglades restoration.

The USSC's land holdings have been used primarily to cultivate sugar cane, but also in the production of vegetables, cattle and citrus. Flooding agricultural soils as part of Everglades restoration may release residual contaminants into the surface water where they have the potential to bio-accumulate in the food

chain. Environmental and ecological risk assessments were performed to address the potential risk associated with inundating these agricultural lands.

We assessed the USSC lands in accordance with our Protocol for Ecological Assessment of Environmental Contaminants on Wetland Restoration Projects in south Florida — developed in cooperation with the District and DEP.

Sampling data collected from the USSC agricultural fields have been put into a database for analysis. The distribution of these contaminants was correlated with

former vegetable farming areas, which contained soils with a high organic carbon content.

Working with the District, our goal is to ensure these lands are suitable for use as water storage reservoirs and treatment marshes and to serve an important role in restoration.

Invasive Species

The invasive Burmese python poses a serious risk to south Florida's ecosystems. So much so that in January 2010 Secretary of the Interior Ken Salazar announced that the U.S. Fish and Wildlife Service (Service) would propose listing the Burmese python and eight other large constrictor snakes that threaten the Everglades and other sensitive ecosystems as "injurious wildlife" under the Lacey Act.

Secretary Salazar made the announcement at the Port of New York, which serves as the largest point of entry in the nation for imports of wildlife and wildlife products. In 2009, Service Inspectors at John F. Kennedy International Airport handled more than 27,000 separate wildlife shipments valued at more than \$1 billion or 16 percent of all U.S. wildlife imports.

The rule, if finalized, would prohibit importation and interstate transportation of the animals. The population of pythons appears to be growing in the Everglades, with estimates in the thousands — putting at risk a variety of imperiled and native species.



Green iguanas have ravenous appetites for vegetation, credit Garry Tucker/USFWS.



An alligator tangles with a Burmese python at Everglades National Park, credit U.S. Geological Survey.

More than 1,000 of the south Asian snakes have been removed from Everglades National Park since 2000, with others appearing in the Florida Keys, along Florida's west coast and farther north. Interagency efforts are underway to address the challenges posed by Burmese pythons and other large constrictor snakes occupying our natural areas.

Given the documented increases in wild Burmese python sightings in and around the Everglades, the Service is working with partners to develop ways of controlling their spread. We worked together to fund an effort with the U.S. Geological Survey to design, implement and evaluate python traps. To date, research and development include testing of trap entrances, development of traps, and testing of traps with and without intercept devices (drift fences) and attractants such as adult female (pheromones) and different baits.

A trap and fence array was developed that successfully captured a Burmese python headed to north Key Largo. Control efforts will reduce the likelihood that a population of invasive giant constrictors will be established in the Florida Keys.

Future priorities include determining the status and extent of the python population, investigating movements and habitat use through radio telemetry to determine effective times and locations for traps, and refining methods to estimate impacts of pythons through studies of their diet and other associated factors.

Examples of other invasive species in south Florida include green iguanas, Nile monitor lizards and sailfin catfish.

Conservation Banking



U.S. Fish and Wildlife Service staff join with community partners to survey land being considered for a conservation bank that would benefit Florida panthers and other species, credit Patrick Pitts.

The first conservation bank in south Florida was established December 21, 2007 — protecting almost 2,000 acres of Florida panther habitat. A new era of private-public partnership had begun.

Conservation banks are permanently protected, privately or publicly owned lands managed for endangered, threatened and other at-risk species. A conservation bank is like a biological bank account.

Through mutual agreement with us, the bank owner obtains the right to sell habitat or species credits. These credits are used by projects to offset impacts from development that may affect the listed species for which the bank was established.

Conservation banks ensure that high quality habitats essential for the survival of the species are protected, comprehensive management plans are developed, and trust funds are established for perpetual management of the property. Banks represent a key tool



Young Florida panther kittens are typically raised in dens hidden among palmetto thickets, credit Mark Lotz.

in our efforts to implement a strategic habitat conservation approach in south Florida. A rigorous process of review and approval for bank plans makes these conservation lands the highest quality and well protected lands in our system and helps set the standard for other lands.

We issued new guidelines for conservation banking in 2003 encouraging private investment in conservation.

As of January 2011, 13 conservation banks were in various stages of development in south Florida, totalling nearly 19,000 acres benefitting species such as Florida panthers, Florida scrub-jays and skinks.

Florida Beaches Statewide Habitat Conservation Plan

The State of Florida received a grant from us to initiate the development of a statewide, multi-species habitat conservation plan (HCP) for Florida's beaches.

The HCP addresses potential impacts to federally listed species along 825 miles of shoreline associated with the Florida Department of Environmental Protection (DEP) issuance of permits through the Coastal Construction Control Line program.

The HCP will bring partners and stakeholders together from 35 coastal counties to address potential impacts of shoreline coastal construction and to consider protection measures on beach habitat important to 15 federally listed species and two candidate species.



A loggerhead sea turtle swims in search of food, credit Larry Linton.

Since the Florida coast is particularly susceptible to hurricanes, this planning process will help the state balance the public's need for shoreline protection, while also ensuring that the needs of at-risk species such as sea turtles are addressed in an environmentally responsible manner during shoreline recovery efforts.

A working group hosted two kick-off meetings with stakeholders, non-governmental organizations, industry representatives, as well as other state and federal agencies to invite participation in the planning process. In addition, the working group developed a draft framework for the various committees and their proposed functions.

To connect with stakeholders on a local level, outreach to all 35 affected counties was conducted. The Florida Beaches HCP website (<http://flbeacheshcp.com/>) was established to provide a conduit to allow the public and participants to be informed and engaged.

By the conclusion of 2008, the foundation for the HCP development effort was firmly established. Momentum continued in 2009 and 2010. The State of Florida was awarded additional grants for the second year to continue planning for the Florida Beaches HCP.

Scrub-Jay Conservation

The key to our successes so far, and those for which we strive for in the future, are coordinated efforts between us, state and local governments and various stakeholders. Collaborative efforts are helping create a long-term future for scrub-jays in south Florida.



A Florida scrub-jay spreads its wings in flight, credit Jessie Dickinson.

We're working with many partners to develop and implement a landscape conservation strategy for the threatened Florida scrub-jay.

We reached out to cities and counties to encourage large-scale habitat conservation plans (HCPs) instead of the small ones created for single-family lots that had been commonplace in years past. Large-scale HCPs are an important part of strategic habitat conservation because they decrease habitat fragmentation by designing large preserves, with high-quality habitat linked with movement corridors.

In these larger preserves, scrub-jays are buffered from the indirect effects of development, and they benefit from proper habitat management that includes prescribed burning. HCP participants also benefit because mitigation costs under these large-scale HCPs are often

less than if an individual had to make their own plan and the permitting process is streamlined.

On Florida's west coast, Sarasota County should have a draft plan completed soon, and Charlotte County and the City of Cape Coral are developing HCPs. In the center of the state, the Board of County Commissioners of Highlands County recently voted to proceed with the HCP process.

We also coordinated with Polk, Indian River, St. Lucie and Martin Counties because they have expressed interest in creating HCPs. Regional HCP planning for the three east coast counties would provide increased conservation benefits over individual county efforts. If accomplished, the majority of scrub-jays within our office's service area will be protected.

Key Largo Woodrat Reintroduction Pilot Program



This is one of 14 Key Largo woodrats used in the pilot program, credit Tampa's Lowry Park Zoo.

For the first time, Key Largo woodrats born in captivity were released into their native habitat at Crocodile Lake National Wildlife Refuge (NWR) in February 2010. This species was listed “endangered” in 1984 under the Endangered Species Act.

The 14 woodrats, bred as part of a joint effort between the U.S. Fish and Wildlife Service, Tampa's Lowry Park Zoo and Disney's Animal Kingdom, were taken to Crocodile Lake NWR by the South Florida Ecological Services Office as part of a pilot program to see if they can survive and breed in the wild.

Upon arrival at Crocodile Lake NWR, the wood rats were placed in individual enclosures with nest structures designed and built by refuge volunteers. Each animal was fed for about seven days until the enclosures were removed.

The Key Largo woodrat historically inhabited tropical hardwood hammock forests throughout Key Largo south to Tavernier. This small mammal was listed as federally endangered in 1984 due to habitat modification and development pressure. Since then, additional threats have emerged, including increased predation pressure from non-native animals such as free-roaming cats and Burmese pythons. After a severe population decline was detected by researchers — estimating less than 90 individuals remained — the Service initiated a captive breeding program in 2002 at Tampa's Lowry Park Zoo and in 2005 at Disney's Animal Kingdom near Orlando.



Daniel Holmes and Sandra Sneckenberger watch as Dr. David Murphy places a Key Largo woodrat into a nest box, credit Tampa's Lowry Park Zoo.

Breeding Key Largo woodrats was a challenge since little was known about the social structure, reproductive biology or ecology of this elusive nocturnal species. Key Largo wood rats are atypical for rodents. They are asocial and females appear to tolerate the presence of males only for breeding. When breeding is successful, females typically produce only two litters per year of one to three pups per litter.

This collaboration to augment the existing wild population, now found only in Key Largo, may prove even more important in the future as this species will be among the first to exhibit impacts from sea level rise.

Picayune Strand Restoration Project

The Picayune Strand Restoration Project is a crown jewel of the Comprehensive Everglades Restoration Plan (CERP). The Department of the Interior provided \$38 million for land acquisition in 1993. Progress continues on this 55,600-acre restoration effort. We celebrated the groundbreaking of important new phases on January 7, 2010 and February 18, 2011.

The project will remove 260 miles of roads, backfill canals, restore surface water flow to wetlands, reduce impacts of wildfire, increase aquifer storage, and control invasive exotic plants, as well as improve hydrology to the adjacent Fakahatchee Strand Preserve State Park and Picayune Strand State Forest.

Removal of a point-source discharge of fresh water to the Faka Union Bay estuary through the Faka Union canal and re-distributing this flow to adjacent rivers and bays will restore the downstream estuaries of the Ten Thousand Islands National Wildlife Refuge, state aquatic preserves, and Everglades National Park, the largest mangrove estuary in the United States.

We've been involved in every step of planning for this project that will benefit the Florida panther, wood stork, and West Indian manatee and many other trust resources. The South Florida Water Management District approved the first water reservation for CERP, setting aside water in the Picayune for the protection of fish and wildlife. With a water reservation in place, volume and timing of water into the project is protected for the natural system.

A major milestone was the multi-agency development and funding of a monitoring plan to assess the status of and anticipated changes to warm-water refuge for up to 300 manatees in a Faka Union Canal marina basin and nearby estuaries. The project is key to completion of a contiguous publicly-owned landscape of over 2 ½ million acres — benefiting many species including the Florida panther.



A young Florida panther kitten nestled in the arms of a conservation specialist, credit Florida Fish and Wildlife Conservation Commission.



West Indian manatees are among the many species that will benefit from restoring the Picayune Strand, credit Larry Linton.



A Florida panther leads her kittens through the woods at Picayune Strand, credit David Shindle, The Conservancy of Southwest Florida.

South Florida Coastal Program: Partnering for Success

The Coastal Program recently celebrated 25 years of coastal habitat conservation across the nation.

Since 1995, the Coastal Program in south Florida has awarded nearly \$4 million for more than 95 projects. Through cost sharing partnerships, this funding has leveraged over \$16 million in total project costs for coastal conservation.

The program achieves voluntary conservation through financial and technical assistance to local partners. Partnerships range from nation-wide collaborations to regional and local working groups and project advisory teams. Our south Florida program coordinator helps identify, develop, and implement on the ground ecosystem-based initiatives.

Our south Florida Coastal Program seeks and promotes partnerships to enlist public action that implements strategic habitat conservation strategies. We are assisting the St. Sebastian River Preserve State Park to implement a large scale mowing and invasive plant management plan throughout more than 1,000 acres of scrub habitat. This work will allow for safe prescribed fire implementation, promote diversity of native grasses, and will benefit federally listed species such as the Florida scrub-jay, red-cockaded woodpecker and eastern indigo snake.

The program also assists communities in conserving coastal resources through ecological restoration, technical assistance regarding lands in need of management or protection, and educational activities. In Palm Beach County, the initial phase of the Juno Dunes Natural Areas hydrological



A roseate spoonbill preens in Florida wetlands, credit Joel Reynolds.

restoration project was completed in 2008. This project will ultimately restore historic freshwater hydroperiods to the disturbed basin marsh, benefitting numerous trust resource species including the endangered wood stork.

The Sanibel-Captiva Conservation Foundation (SCCF), in partnership with the City of Sanibel and the J.N. "Ding" Darling National Wildlife Refuge, has a goal of complete eradication of invasive exotic plant species on Sanibel Island. With funds from the Coastal Program, SCCF will complete their cooperative agreement for the removal and maintenance of Brazilian pepper and Australian pine trees on all public lands on the island in FY 2011.

The large variety of partners engaged with the program reflects the complexity of ownership and management of south Florida's coastal areas. Promoting relationships on both public and private lands is a key strategy to achieving results on a landscape level. Our Coastal Program partners with regional Cooperative Invasive Species Management Areas (CISMAs) to combat the persistent challenge of invasive exotic species management and provides a platform to bridge the gap between public and private landowners.

In 2006, the Coastal Program Strategic Plan was developed and outlined core component goals at a national level, as well as within each

Regional Program's field offices. The primary goals of the program are to conserve habitat for the benefit of priority fish and wildlife species throughout south Florida through partnerships and work hand-in-hand with stakeholders. In 2011, our Strategic Plan will be renewed for another five years and consider more recently acknowledged challenges such as climate change. While there is still a great deal of uncertainty and discussion regarding potential climate changes impacts to our coastal ecosystems, the question with respect to restoration activities is how to balance rebuilding past systems while establishing resilient systems for the future.

Imperiled Bird Conservation in the Everglades

The Central and Southern Florida Project of the mid-20th Century fundamentally changed the flow of water in the Everglades. The River of Grass, so aptly named by Marjory Stoneman Douglas, was transformed into a compartmentalized system that included 1,700 miles of levees and canals.

Bird life was severely affected. Population declines of wading birds reached 90 percent, and some species became imperiled such as the Everglade snail kite, Cape Sable seaside sparrow, roseate spoonbill and wood stork. Scientific reviews have consistently showed that Everglades restoration is the best hope imperiled birds have for recovery. In a nutshell, restoration and recovery are one and the same.

The continuing declining condition of imperiled birds has given the restoration effort a new sense of urgency. For example, a recent report by the National Academy of Sciences stated:

“To do nothing is, in fact, to do harm. The nation risks losing some populations associated with the Everglades.



Restoring the Everglades is crucial to the survival of endangered birds such as the Cape Sable seaside sparrow, credit Lori Oberhofer, Everglades National Park.



An Everglade snail kite clutches an apple snail while preparing to land, credit Vince Lamb.

Populations of some bird species, including the Cape Sable seaside sparrow and the snail kite, are at risk.”

We’re completing a multi-faceted effort to conserve birds during the transitional period between today and the completion of Everglades restoration. Specifically, the effort includes four central components:

- using existing flexibility to maximize benefits for multiple species;
- improving our scientific understanding for management action;
- advancing restoration projects that will incrementally improve conditions; and
- monitoring populations and the benefits of early restoration projects to manage adaptively and get the most for the ecosystem.

Existing water infrastructure in south Florida is inherently limited, which is why restoration is so needed. Some flexibility is available, however, and this flexibility will continue to be used to the extent possible. For example, in the fall of 2008 Tropical Storm Fay created very high water levels in Water Conservation Area 3A, adversely impacting multiple species

including the kite and its primary food, the apple snail. The Florida Fish and Wildlife Conservation Commission led a team of partners to reduce water levels. With much help from Mother Nature, the U.S. Army Corps of Engineers and the South Florida Water Management District used their operational flexibility to reduce the level in southern WCA 3A by one foot in a month. Given the concern for birds and other wildlife in the southern Everglades, this collaboration will continue until restoration is complete.

We’re working with leaders in the scientific community to understand how restoration can benefit imperiled birds. For example, collaboration is underway with kite and apple snail scientists to develop water management regimes that will benefit many species.

This information is being used to improve conditions within existing flexibility. On a related front, we’re also working with sparrow experts to minimize impacts on nesting success from predation, determine whether unoccupied habitat exists, and implement an emergency action plan that outlines benchmarks for taking management action.

We're working with many partners to plan and implement key restoration projects, which will provide incremental improvements for many species of birds.

The Modified Water Deliveries to Everglades National Park project, for example, will benefit kites, sparrows, woodstorks and spoonbills. The C-111 project will help rehydrate Taylor Slough and benefit many species, most notably spoonbills. Other projects related to restoration such as Everglades National Park Seepage Management and Decentralization are among our top priorities.

We'll continue to work with leading researchers to understand population trends and seize conservation opportunities. Monitoring will be a key part of restoration projects, both to measure restoration benefits and also to understand any short term negative impacts on bird populations and habitats that may occur while the system restores itself. This information will allow us to adaptively manage during this transitional phase until restoration is complete.

Restoring the Everglades will help recover and sustain multiple avian species such as woodstorks, credit USFWS.



An Audubon's Crested Caracara is a strong flyer but spends a lot of time on the ground, credit South Florida Water Management District



Restoring the Everglades will help recover and sustain multiple avian species such as the Everglade snail kite, credit Rob Bennetts.



Appendix:

South Florida's Federally Listed Imperiled Species



The Florida leafwing butterfly is currently listed as a candidate species, credit Holly L. Salvato.



The Key Largo Woodrat is inseparately linked to its hardwood hammock habitat, credit USFWS.

Common Name	Scientific Name	Status
Birds		
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	T
Bachman's warbler	<i>Vermivora bachmanii</i>	E
Cape Sable seaside sparrow	<i>Ammodramus maritimus mirabilis</i>	E CH
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	E CH
Florida grasshopper sparrow	<i>Ammodramus savannarum floridanus</i>	E
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	T
Ivory-billed woodpecker	<i>Campephilus principalis</i>	E
Kirtland's warbler	<i>Dendroica kirtlandii</i>	E
Piping plover	<i>Charadrius melodus</i>	T CH
Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Red knot	<i>Calidris canutus rufa</i>	C
Roseate tern	<i>Sterna dougallii dougallii</i>	T
Whooping crane	<i>Grus americana</i>	E/XN
Wood stork	<i>Mycteria americana</i>	E
Fish		
*Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T
*Smalltooth sawfish	<i>Pristis pectinata</i>	E CH
Mammals		
*Fin whale	<i>Balaenoptera physalus</i>	E
Florida bonneted bat	<i>Eumops floridanus</i>	C
Florida panther	<i>Puma (=Felis) concolor coryi</i>	E
Puma (=mountain lion)	<i>Puma (=Felis) concolor</i> (all subsp. except <i>coryi</i>)	T/SA
Key deer	<i>Odocoileus virginianus clavium</i>	E
Key Largo cotton mouse	<i>Peromyscus gossypinus allapaticola</i>	E
Key Largo woodrat	<i>Neotoma floridana smalli</i>	E
Lower Keys marsh rabbit	<i>Sylvilagus palustris hefneri</i>	E
*North Atlantic right whale	<i>Eubalaena glacialis</i>	E CH
Rice rat	<i>Oryzomys palustris natator</i>	E CH
*Sei whale	<i>Balaenoptera borealis</i>	E
Southeastern beach mouse	<i>Peromyscus polionotus niveiventris</i>	T
West Indian manatee	<i>Trichechus manatus</i>	E CH
Reptiles		
American crocodile	<i>Crocodylus acutus</i>	T CH
American alligator	<i>Alligator mississippiensis</i>	T/SA
Atlantic salt marsh snake	<i>Nerodia clarkii taeniata</i>	T
Bluetail mole skink	<i>Eumeces egregius lividus</i>	T
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T
*Green sea turtle	<i>Chelonia mydas</i>	E CH
*Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E CH
*Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E
*Leatherback sea turtle	<i>Dermochelys coriacea</i>	E CH
*Loggerhead sea turtle	<i>Caretta caretta</i>	T
Sand skink	<i>Neoseps reynoldsi</i>	T

E-Endangered

T-Threatened

C-Candidate

CH-Critical Habitat

P-Proposed E, T or CH

S/A-Similarity of Appearance

*Contact NOAA Fisheries for species, for sea turtles in water.

(List revised in November 2009)

<i>Common Name</i>	<i>Scientific Name</i>	<i>Status</i>
Invertebrates		
Bartram's hairstreak butterfly	<i>Strymon acis bartrami</i>	C
Florida leafwing butterfly	<i>Anaea troglodyta floralis</i>	C
Highlands tiger beetle	<i>Cicindela highlandensis</i>	C
Miami blue butterfly	<i>Cyclargus thomasi bethunebakeri</i>	C
Schaus swallowtail butterfly	<i>Heracles aristodemus ponceanus</i>	E
Stock Island tree snail	<i>Orthalicus reses</i> (not incl. <i>nesodryas</i>)	T
Corals		
*Elkhorn coral	<i>Acropora palmata</i>	T CH
*Staghorn coral	<i>Acropora cervicornis</i>	T CH
Plants		
Crenulate lead-plant	<i>Amorpha crenulata</i>	E
Blodgett's silverbrush	<i>Argythamnia blodgettii</i>	C
Four-petal pawpaw	<i>Asimina tetramera</i>	E
Florida bonamia	<i>Bonamia grandiflora</i>	T
Florida brickell-bush	<i>Brickellia mosieri</i>	C
Fragrant prickly-apple	<i>Cereus eriophorus</i> var. <i>fragrans</i>	E
Big Pine partridge pea	<i>Chamaecrista lineata keyensis</i>	C
Deltoid spurge	<i>Chamaesyce deltoidea</i> ssp. <i>deltoidea</i>	E
Pineland sandmat	<i>Chamaesyce deltoidea pinetorum</i>	C
Wedge spurge	<i>Chamaesyce deltoidea serpyllum</i>	C
Garber's spurge	<i>Chamaesyce garberi</i>	T
Pygmy fringe-tree	<i>Chionanthus pygmaeus</i>	E
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	C
Florida golden aster	<i>Chrysopsis floridana</i>	E
Florida perforate cladonia	<i>Cladonia perforata</i>	E
Pigeon wings	<i>Clitoria fragrans</i>	T
Short-leaved rosemary	<i>Conradina brevifolia</i>	E
Florida semaphore cactus	<i>Consolea corallicola</i>	C
Avon Park harebells	<i>Crotalaria avonensis</i>	E
Okeechobee gourd	<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>	E
Florida prairie-clover	<i>Dalea carthagenensis floridana</i>	C
Beautiful pawpaw	<i>Deeringothamnus pulchellus</i>	E
Garrett's mint	<i>Dicerandra christmanii</i>	E
Scrub mint	<i>Dicerandra frutescens</i>	E
Lakela's mint	<i>Dicerandra immaculata</i>	E
Florida pineland crabgrass	<i>Digitaria pauciflora</i>	C
Scrub buckwheat	<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	T
Snakeroot	<i>Eryngium cuneifolium</i>	E
Small's milkpea	<i>Galactia smallii</i>	E
*Johnson's seagrass	<i>Halophila johnsonii</i>	T CH
Aboriginal prickly-apple	<i>Harrisia aboriginum</i>	C
Highlands scrub hypericum	<i>Hypericum cumulicola</i>	E
Beach Jacquemontia	<i>Jacquemontia reclinata</i>	E
Scrub blazingstar	<i>Liatris ohlingeriae</i>	E
Sand flax	<i>Linum arenicola</i>	C
Carter's small-flowered flax	<i>Linum carter carteri</i>	C
Scrub lupine	<i>Lupinus aridorum</i>	E
Britton's beargrass	<i>Nolina brittoniana</i>	E
Papery whitlow-wort	<i>Paronychia chartacea</i>	T
Key tree cactus	<i>Pilosocereus robinii</i>	E
Lewton's polygala	<i>Polygala lewtonii</i>	E
Tiny polygala	<i>Polygala smallii</i>	E
Wireweed	<i>Polygonella basiramia</i>	E
Sandlace	<i>Polygonella myriophylla</i>	E
Scrub plum	<i>Prunus geniculata</i>	E
Everglades bully	<i>Sideroxylon reclinatum</i> ssp. <i>austrofloridense</i>	C
Florida bristle fern	<i>Trichomanes punctatum</i> subsp. <i>floridanum</i>	C
Wide-leaf warea	<i>Warea amplexifolia</i>	E
Carter's mustard	<i>Warea carteri</i>	E
Florida ziziphus	<i>Ziziphus celata</i>	E



The Key deer are the smallest of the 28 subspecies of Virginia white-tailed deer; credit USFWS.



Marilyn Knight of the South Florida Ecological Services Office plants some Lakela's mint. This endangered plant is only found in Indian River and St. Lucie Counties in Florida; credit USFWS.

Back cover: an Everglade snail kite hunts for food; credit Vince Lamb.

U.S. Fish & Wildlife Service

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