The South Florida Ecosystem Restoration Task Force

July 2010 - June 2012

Strategy and Biennial Report

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The South Florida Ecosystem Restoration Task Force

Authorized by Congress, the South Florida Ecosystem Restoration Task Force (Task Force) brings together the federal, state, tribal, and local agencies involved in restoring and protecting the Everglades. The role of the intergovernmental Task Force is to facilitate the coordination of the myriad conservation and restoration efforts being planned and implemented. It provides a forum for the participating agencies to share information about their restoration projects, resolve conflicts, and report on progress.

Report Purpose

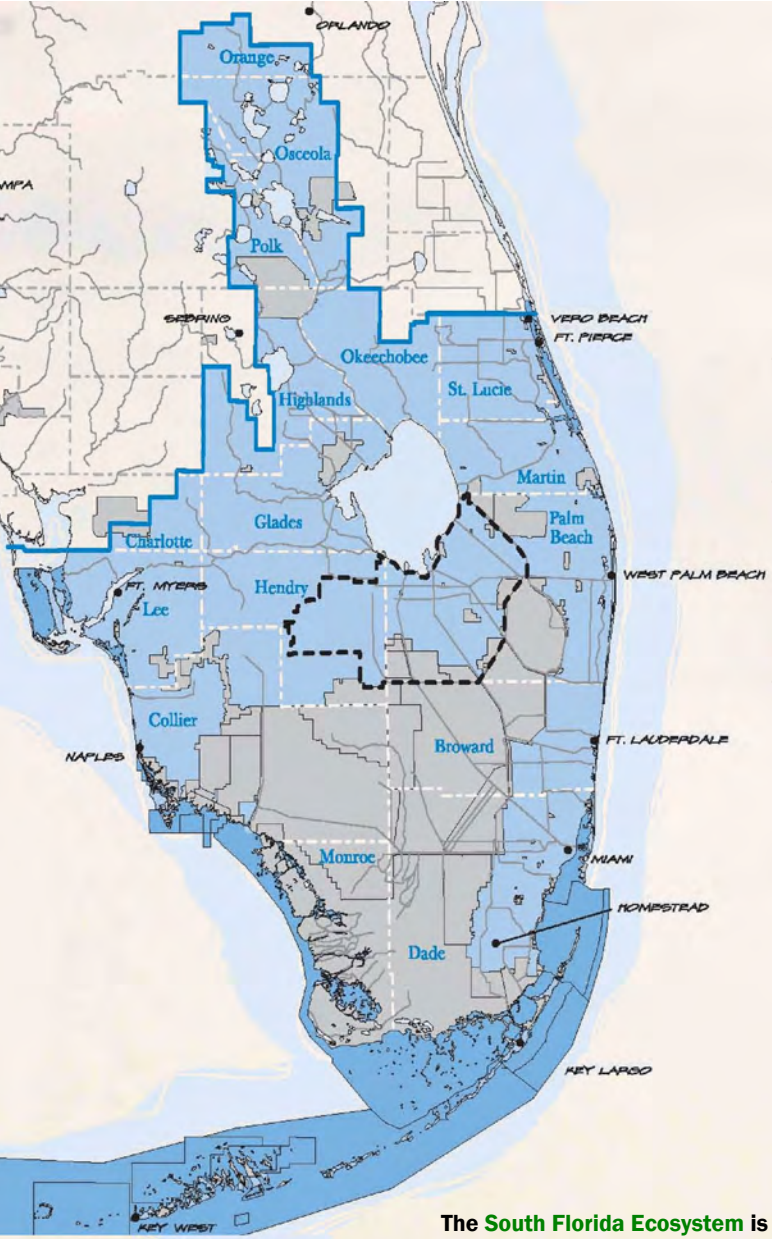
This document responds to congressional direction to outline how the restoration effort will occur and also satisfies the requirements of the Water Resources Development Act of 1996 to report biennially on Task Force activities and progress made toward restoration. The reporting period is July 2010 – June 2012.

This document is intended for four principal audiences:

- United States Congress
- Florida Legislature
- Seminole Tribe of Florida
- Miccosukee Tribe of Indians of Florida

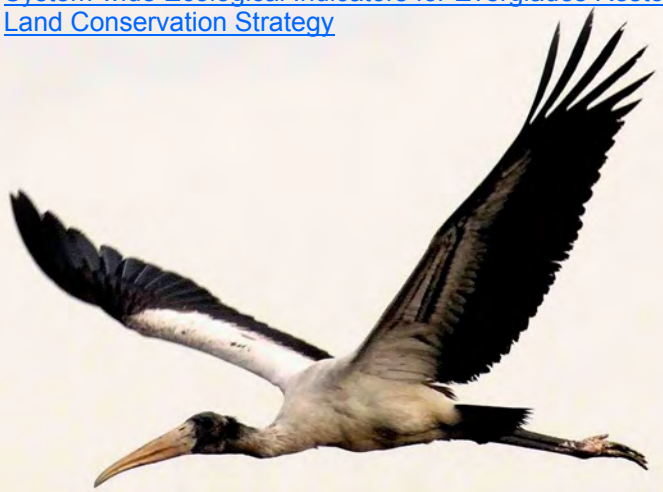
This document synthesizes information from the following reports:

- Integrated Financial Plan
- System-wide Ecological Indicators for Everglades Restoration
- Land Conservation Strategy



South Florida Ecosystem Boundary
Everglades Agricultural Area
Conservation and Tribal Lands
Non-Public Land

The South Florida Ecosystem is a unique natural treasure. An 18,000-square-mile region of subtropical uplands, wetlands, and coral reefs, the ecosystem extends from the Kissimmee Chain of Lakes south of Orlando to Florida Bay and the reefs southwest of the Florida Keys.



To access these reports and for further details on information presented in this document, please visit:

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Executive Summary

Restoring the Everglades and protecting the natural resources in south Florida cannot be achieved by any single organization but depends upon a strategically coordinated set of federal, state, local, and tribal initiatives, funding, and partnerships. These restoration programs and projects requires a long-term process for addressing key technical, management, and policy issues. The intergovernmental South Florida Ecosystem Restoration Task Force (Task Force) was authorized by Congress in 1996 to provide this long-term strategic coordination and incorporation of new information and opportunities over the multi-decade restoration initiative. Among other things, this large interwoven complex of restoration programs requires specific project authorizations through periodic Water Resources Development Acts, and absent such authorizations, challenges lay ahead.

Restoration Framework

The Task Force has developed a restoration framework that includes a shared vision, strategic goals, and system-wide ecological indicators to organize and assess this complex intergovernmental effort.

Vision

A healthy South Florida Ecosystem that supports diverse and sustainable communities of plants, animals, and people.

Strategic Goals & Project Implementation

Goal 1. Get the Water Right

Goal 2. Restore, Preserve, and Protect Natural Habitats and Species

Goal 3. Foster Compatibility of the Built and Natural Systems

The Task Force organizes and tracks over 200 programs and projects by the three strategic goals (pages 5–34).

System-wide Ecological Indicators & Ecosystem Response. The Task Force uses system-wide ecological indicators to assess the current status of the ecosystem and to track how it will respond to the implementation of the suite of restoration projects and system-wide operational changes over time. The "stoplight" assessment of the system-wide ecological indicators communicates overall ecosystem health (pages 35).

Combined, the strategic goals and system-wide ecological indicators provide a means of assessing restoration progress via both project implementation and ecosystem response.

Restoration Highlights

Over the past two years partnerships have been strengthened, construction groundbreakings have occurred, and efforts to improve the U.S. Army Corps of Engineers (USACE or Corps) Civil Works planning process have begun. The following examples are provided to illustrate these accomplishments.

Strengthening Partnerships and Moving Forward. The Comprehensive Everglades Restoration Plan (CERP) is the single largest component of the South Florida Ecosystem restoration initiative. The state and federal partners work closely together to seek resolution of policy challenges that impede CERP implementation. Over the past two years, the federal and state administrations have prioritized partnerships and as a result have made significant progress on planning, implementation, and conflict resolution. Today, intergovernmental relationships in the Everglades are as strong as they have ever been.

A Bold New Way to Plan Restoration Projects. Under CERP, the Central Everglades Planning Project (CEPP) was initiated in 2011 to restore the "Heart of the Everglades." In October 2011, the Assistant Secretary of the Army (Civil Works), the Secretary of the Interior, the Governor of Florida, the Executive Director of the South Florida Water Management District (SFWMD), and other senior principals agreed to initiate this planning effort. It is part of the Corps' National Pilot Program for Feasibility Studies, an effort to reduce planning timelines without reducing the quality of analysis by using clearly defined decision points to make the process more predictable and efficient. This effort has been accompanied by an enhanced public participation effort sponsored by the South Florida Ecosystem Restoration Task Force's Working Group (WG) and Science Coordination Group (SCG). See pg. 75 for more on the workshops sponsored by the WG and SCG to enhance public participation in the CEPP. For more information on CEPP, please visit http://www.sfrestore.org/cepp/cepp.html.

Central Everglades Planning Project
The next increment of CERP that focuses on restoration of increased natural flows into and through the central and southern Everglades is the Central Everglades Planning Project (CEPP). This plan aims to improve the quantity, quality, timing, and distribution of water in the Northern Estuaries, Water Conservation Area (WCA) 3, and Everglades National Park (ENP) in order to restore the hydrology, habitat, and functions of the natural system while considering land already purchased and water quality standards.

For the CEPP, the Corps is implementing a more efficient process to prepare a recommended plan. By using clearly defined decision points, the Corps is making the planning process more predictable and efficient and reducing the federal CERP planning process timeline while retaining the quality of the analysis.

Photo by Carlton Ward, Jr.

Incorporating updated science and technical information and using clearly defined decision points, the process is expected to reduce the amount of time needed to prepare finalized plans for congressional authorization as part of the CERP. This state-federal initiative will complement work already accomplished by the State to improve water quality in the central Everglades and will result in a finalized plan to be submitted for Congressional authorization as part of the state-federal CERP.

Restoring Wetlands. The U.S. Department of Agriculture (USDA) continues to demonstrate its commitment to restoring the Everglades through increased financial and technical assistance to landowners. In July 2012, the USDA announced a third year of large conservation easement purchases through the Wetlands Reserve Program (WRP). Secretary Vilsack announced $80 million in financial assistance to acquire permanent easements and restore wetlands on 23,000 acres of agricultural lands in the Northern Everglades Watershed. WRP is implemented through USDA's Natural Resources Conservation Service (NRCS). In 2011, Agriculture Secretary Tom Vilsack also announced $100 million in financial assistance to acquire permanent WRP easements from eligible landowners in Glades, Hendry, Highlands, and Okeechobee Counties, all within the Northern Everglades Watershed. This was the largest amount of WRP funding Florida ever received for projects in the same watershed in a single year. This funding is also assisting with wetland restoration on nearly 24,000 acres of agricultural land. In 2010, USDA provided $86 million for the Fisheating Creek WRP project in the Northern Everglades which is a significant restoration effort on 26,000 acres in Highlands County. See pg. 27 for more on the USDA's WRP program.

Protecting the Headwaters. The planning process for the U.S. Department of Interior's (DOI) Everglades Headwaters National Wildlife Refuge and Conservation Area began with the approval of the Preliminary Project Proposal in August 2010. Preliminary informational meetings occurred throughout the remainder of 2010, followed by a formal project planning announcement by Secretary Ken Salazar in January 2011. The planning effort resulted in the authorization of the 556th national wildlife refuge.

Executive Summary

The refuge was formally established on January 18, 2012 with the U.S. Fish and Wildlife Service's (USFWS) acceptance of a 10 acre donation from The Nature Conservancy (TNC). The Service requested a reprogramming to reprioritize funding for Federal land acquisition projects funded through the Land and Water Conservation Fund. In April 2012, Congress approved this reprogramming, which provided $1.5 million for land acquisition at the Everglades Headwaters National Wildlife Refuge and Conservation Area. For more information please visit http://www.fws.gov/southeast/evergladesheadwaters/.

Restoring Hydrology. Three major groundbreakings were held during the past two years. The first was held in October 2010 for the Site 1 Impoundment, Phase 1 project. This project is designed to capture and store local runoff during wet periods and then use that water to supplement water deliveries to the Hillsboro Canal basin during dry periods thus reducing the demands for releases from Lake Okeechobee and the Arthur R. Marshall Loxahatchee National Wildlife Refuge (LNWR). Reducing the need for releases from the LNWR during the dry season to meet local water demands will facilitate the maintenance of more natural, desirable, and consistent water levels within the LNWR. This was followed by another significant groundbreaking in February 2011 one component of the Picayune Strand Restoration Project: the FAKA Union Pump Station Project. This Faka Union Pump Station work is the second contract administered by the USACE to help improve the hydrology and natural resources in this portion of the South Florida Ecosystem. The third groundbreaking was held in October 2011 for the Indian River Lagoon South project. This project will help restore the St. Lucie estuary and southern portion of the Indian River Lagoon.

Reviving a River. During the reporting period, restoration of the Kissimmee River has continued with 13 miles of river restored along with 6,500 acres of floodplain. Surrounding habitats have responded to the re-establishment of the historic oxbows and natural flow of the river. Numerous native species are illustrating the immediate benefits of flow restoration, including a marked resurgence in wading birds and numerous fish, duck, and shorebird species (page 7).

Photo by Bill Perrry

Executive Summary

Protecting Habitat and Species. A large and continuous piece of land critical for wildlife passage and the recovery of the Florida panther was purchased and protected by a collaborative public and private partnership including the USFWS, NRCS, and TNC in an outstanding effort to accomplish species conservation. The conservation easements established on the 1,278-acre American Prime property along the Caloosahatchee River in Glades County is a key natural landscape through which Florida panthers can disperse from habitats farther south. See page 28 for more on this successful conservation partnership.

Collaborating on Next Steps for Water Quality. In June 2012, the Florida Department of Environmental Protection (FDEP) received notification from the U.S. Environmental Protection Agency (USEPA) stating the "permit revisions address our objections to prior permits received by USEPA and the State's plan meets the water quality goals in the September 3, 2010, Amended Determination (AD) and establishes an enforceable framework for ensuring compliance with the Clean Water Act and its applicable regulations." This action paved the way for the FDEP to move forward under the State's administrative processes to notice and successfully issue final permits and associated consent orders to implement a historic plan — including an achievable strategy and enforceable schedule for constructing an array of treatment projects and associated water storage — to improve water quality in the Everglades. For more information, please visit http://depnewsroom.wordpress.com/2012/06/13/florida-moving-forward-with-plan-to-improve-water-quality-in-americas-everglades/ .

Why Restoration

The South Florida Ecosystem supports some of the greatest biodiversity on earth. More than a century of changes to the environment have put the ecosystem in jeopardy.

The quality of life in south Florida and the region's economy depend on the health and vitality of the natural system. South Florida's environment provides unique recreational opportunities that draw visitors from around the globe, from freshwater fishing in the north to coral reef snorkeling in the Keys. Fertile soils support the region's agricultural industry. The Seminole and the Miccosukee Tribes live in the Everglades and their cultures and ways of life depend on the health of this ecosystem. Yet the waters, natural habitats, and native species of the South Florida Ecosystem are at risk.

A healthy ecosystem depends upon reversing the unintended consequences of past changes to the region's waters and habitats. Historically, water flowed slowly from the Kissimmee River to Florida Bay across the ecosystem's extremely flat landscape forming what became known as the "River of Grass." This natural functioning system began to be altered over a century ago.

Altering an Ecosystem

Motivated by the Swamp and Overflowed Lands Act of 1850, efforts began in the late 1800s to "reclaim" the Everglades for agricultural, residential, and commercial development. Wetlands were drained or filled, and canals, roads, and buildings began to displace native habitats and disrupt historical water flows.

In 1948, the ongoing efforts to drain the Everglades, protect the region from hurricanes, and make the region more habitable led to the Central and Southern Florida (C&SF) Flood Control Project. Authorized by Congress, the C&SF Project significantly altered the region's hydrology. It succeeded in draining half of the original Everglades and allowed for the expansion of coastal cities, particularly in the southeast, as well as interior farming areas such as the Everglades Agricultural Area (EAA) south of Lake Okeechobee.

Today, the C&SF project is comprised of over 1,800 miles of canals and levees and 200 water control structures and drains approximately 1.7 billion gallons of water per day into the Atlantic Ocean and Gulf of Mexico.

The C&SF Project was accompanied by other efforts to control water and develop the region. For example, the Kissimmee Flood Control Project channelized the Kissimmee River in the 1960s for flood protection and navigation. The project ultimately drained two-thirds of the historical floodplain and caused severe declines in wading bird and fish populations.

The cumulative adverse impacts of these water control projects upon water quality, habitats, and species were immense and the ecosystem declined. Extensive growth and development as a result of these projects further exacerbated the ecosystem's decline. Research in the 1970s and 1980s detected declines in the populations of many native plant and animal species and discovered heightened phosphorus pollution in the Everglades. Particularly alarming was evidence of the deterioration of Florida Bay, indicated by frequent algae blooms, dramatic losses in seagrass habitat, reductions in many shrimp and fish species, and a decline in water clarity.

Early Efforts toward Restoration

Public policy, in line with predominant public opinion, began to move in the direction of environmental protection and restoration in south Florida. During the 1970s and 1980s, several key pieces of environmental legislation were passed and conservation programs initiated. (For more information see page 69).

Individual restoration projects were begun, aiming to correct specific environmental concerns in focused areas. However, the complexity and sheer size of the ecosystem limited the ability of these individual efforts to realize restoration at the ecosystem scale. It was soon recognized that a piecemeal approach to restoration was not enough; a comprehensive ecosystem-wide restoration effort was needed.

Establishing a Coordinated & System-wide Restoration Effort

Acknowledging the need for an ecosystem-wide approach to better coordinate the individual efforts, a federal task force on Everglades

restoration was established through an interagency agreement in 1993. The following year, the Governor of Florida established the Governor's Commission for a Sustainable South Florida (GCSSF) "to develop recommendations and public support for regaining a healthy Everglades ecosystem with sustainable economies and quality communities." In recognition of the magnitude of the restoration effort and the critical importance of partnerships with state, tribal, and local governments, the current intergovernmental Task Force was established by the Water Resources Development Act (WRDA) of 1996. The Task Force and the GCSSF were instrumental in formulating a forum for consensus building in the early stages of ecosystem restoration.

The WRDA of 1996 also called for a comprehensive approach to restoring the hydrology of south Florida. The result was the CERP, a consensus plan approved by Congress and signed by the President as part of WRDA 2000. The CERP is designed to reverse unintended consequences resulting from the construction and operation of the C&SF Project.

While the CERP is the most significant component of the efforts to restore a more natural hydrology, there are other non-CERP "foundation" projects such as the Kissimmee River Restoration Project and the Modified Water Deliveries to Everglades National Park Project (Mod Waters). The overall South Florida Ecosystem restoration effort also includes projects to improve water quality, restore natural habitats, and protect native species.

The restoration challenges faced in south Florida must be solved collaboratively. Rather than dealing with issues independently, the challenge is to seek out the interrelationships and mutual dependencies that exist among all the components of the ecosystem.

The Task Force advocates a system-wide approach that addresses issues holistically, recognizing that the various levels of government have distinct jurisdictions and certain responsibilities that can be coordinated but not shared. The Task Force also recognizes the need to incorporate new information into the restoration process .

Key Environmental Legislation & Programs
2010–2012

2010	Florida Legislature allocates $50,000,000 to Everglades Restoration.
2010	Florida Legislature creates Chapter 373 Part VII entitled Water Supply Policy, Planning, Production, and Funding.
2010	State legislation provides that land interests held by the SFWMD are not subject to extinguishment by the Marketable Record Title Act (HB435).
2010	USDA announces $89 million in financial assistance for a special Florida WRP project in the Northern Everglades watershed that brings conservation easements to almost 26,000 acres of critical wetland habitat.
2011	Florida Legislature allocates $29,955,000 to Everglades Restoration.
2011	Florida Legislature is required to annually review the preliminary budget and authorized millage rate for each water management district and set the amount of revenue a district may raise through its ad valorem tax authority; Legislative Budget Commission line item veto authority is allowed in addition to Governor's veto authority.(SB2142)
2011	Central Everglades Planning Project initiated.
2012	Consolidated Appropriations Act (Public Law 112-74) authorized construction of the Tamiami Trail: Next Steps Project consisting of four bridges with a combined length of 5.5 miles.
2012	Florida Legislature allocates $30,000,000 to Everglades Restoration.
2012	Miami-Dade Lake Belt Mitigation Plan: State amends that fees collected under the Lake Belt statute from "water treatment plant upgrades" be redirected to the SFWMD; amendment provides additional money into the Lake Belt Mitigation Trust Fund for seepage mitigation projects.
2012	State legislation encourages agricultural public-private partnerships to accomplish water storage and water quality improvements (HB1389).
2012	Florida Legislature removes revenue caps and restores Governor independent line item veto authority for water management district budgets (SB1986).
2012	USFWS lists the Burmese python and several other large constrictor snakes as injurious species under the Lacey Act.

Note: For key environmental legislation and programs prior to 2010, please see pages 69 - 71.

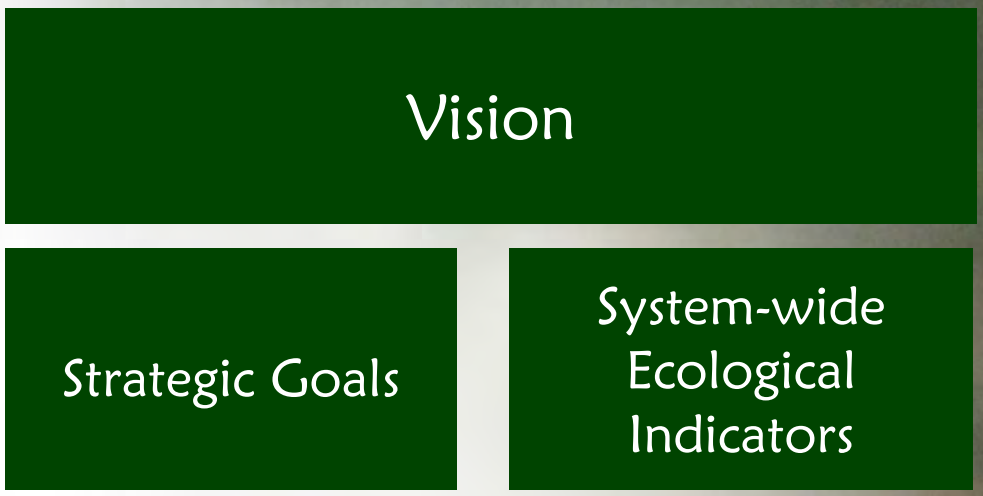
Photo by Jose Cabaleiro

Restoration Framework

The Task Force has developed a restoration framework that includes a shared vision, strategic goals, and system-wide ecological indicators.

The overall premise of restoration is that the ecosystem must be managed from a system-wide perspective. Rather than dealing with issues independently, the challenge is to understand the interrelationships that exist among all the components of the ecosystem. The same issues that are critical to the natural environment — getting the water right and restoring, preserving, and protecting diverse habitats and species — are equally critical to maintaining a quality environment for south Florida's residents and visitors.

The success of this comprehensive approach depends on the coordination and integration of over 200 individual restoration projects carried out by various agencies at all levels of government, and with input from the public. Each agency brings its own authority, jurisdiction, capabilities, and expertise to this initiative and applies them through its individual programs, projects, and activities. The Task Force organizes, coordinates, and measures the progress of the ecosystem restoration program.



The overarching goal of the Task Force's restoration framework is a common **vision** of the restored ecosystem.

The Task Force tracks progress toward the vision on two paths:

1. The implementation of restoration projects (by **strategic goal**), and
2. The general status of the ecosystem and how the key ecological components respond to implementation of restoration projects (via **system-wide ecological indicators**).

Photo by Brent Anderson

Vision

A healthy South Florida Ecosystem that supports diverse and sustainable communities of plants, animals, and people.

The Task Force has established a shared vision that recognizes the linkages between the region's natural and built environments and the need for ecosystem-wide restoration.

The region's rich and varied habitats will become healthy feeding, nesting, and breeding grounds for diverse and abundant fish and wildlife. Endangered species will recover. Commercial fishing, farming, recreation, and tourism dependent businesses and associated economies will benefit from a viable, productive, and aesthetically beautiful resource base. The quality of life enjoyed by residents and visitors will be enhanced by sustainable natural resources and by access to natural areas managed by federal, state, and local governments to provide a great variety of recreational and educational activities.

It is important to understand that the restored Everglades of the future will be different from any version of the Everglades that has existed in the past. The restored Everglades will be smaller and arranged somewhat differently than the historic ecosystem. However, it will have recovered those hydrological and biological characteristics that defined the original Everglades and made it unique among the world's wetland systems. It will evoke the wildness and richness of the former Everglades.

Strategic Goals

Goal 1. Get the Water Right

Goal 2. Restore, Preserve, and Protect Natural Habitats and Species

Goal 3. Foster Compatibility of the Built and Natural Systems

The three strategic goals recognize that water, habitats, species, and the built environment are inextricably linked in the ecosystem and must be addressed simultaneously if the ecosystem is to be restored and preserved over the long term.

Because of the complexity and the long timeframe of the restoration initiative, it is important to measure and track the hundreds of activities that must be performed to achieve the result of a restored ecosystem.

The strategic goals and related subgoals organize the myriad projects. Measurable objectives have been established to track project implementation and restoration progress.

The strategic goals, subgoals, and measurable objectives are discussed on pages 5–34. Some of the restoration projects are multipurpose in nature, and provide results for more than one measurable objective. In this report, multipurpose projects are listed once, under their primary measurable objective.

Further information on the projects can be found within the 2012 Integrated Financial Plan (IFP).

System-wide Ecological Indicators

- **Invasive Exotic Plants**
- **Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation**
- **Eastern Oysters**
- **Crocodilians (American Alligators & Crocodiles)**
- **Fish and Macroinvertebrates**
- **Periphyton & Epiphyton**
- **Wading Birds (White Ibis and Wood Stork)**
- **Southern Estuaries Algal Blooms**
- **Florida Bay Submersed Aquatic Vegetation**
- **Juvenile Pink Shrimp**
- **Wading Birds (Roseate Spoonbill)**

Eleven system-wide ecological indicators have been carefully selected by the SCG and independently reviewed to assess the success of the Everglades restoration program from a system-wide perspective. These indicators cover the spatial and temporal scales and features of the ecosystem.

System-wide ecological indicators make understanding an ecosystem possible in terms of management, time, and costs. The selected indicator species can be monitored in a relatively small number of locations to measure the progress of the restoration.

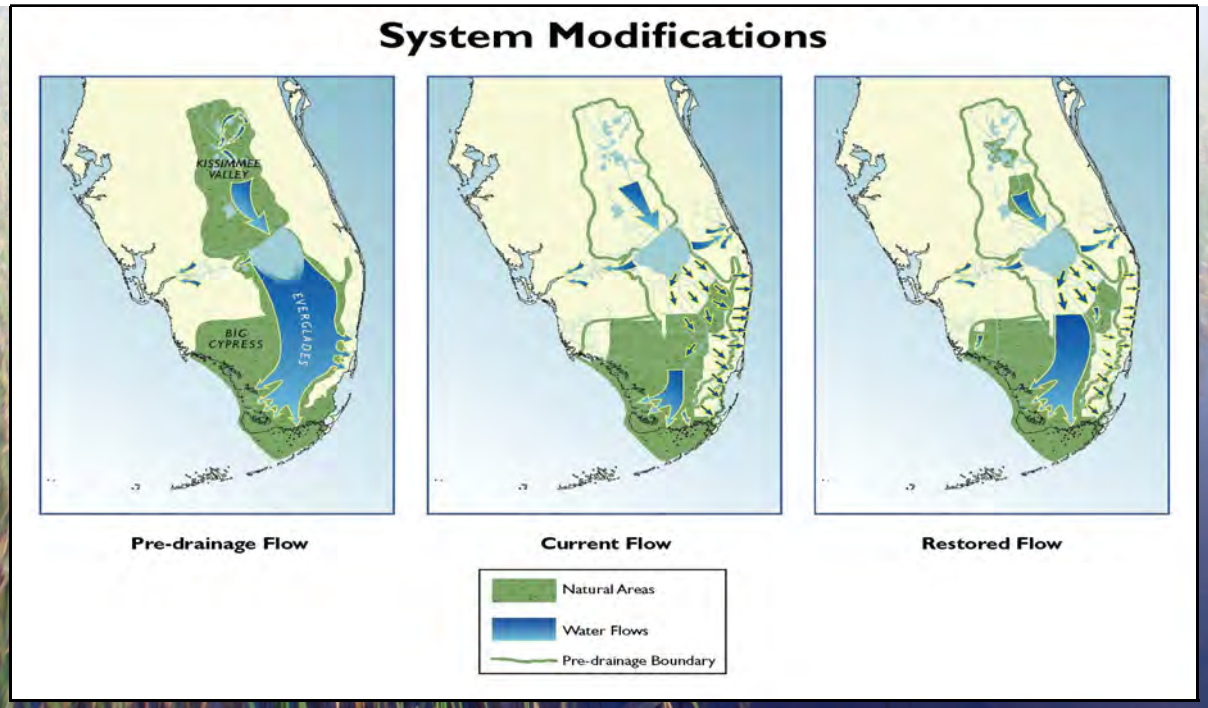
The suite of system-wide ecological indicators is discussed beginning on page 35.

Goal 1: Get the Water Right

Water is the lifeblood of the South Florida Ecosystem, supporting many unique habitats. By the year 2000, historic water flows had been reduced to less than one-third of those that had once flowed through the Everglades. The quality of water that entered the ecosystem had been seriously degraded. Water did not flow at the same times or durations as it had historically, nor could water move freely through the system. The whole South Florida Ecosystem suffered. The health of Lake Okeechobee was seriously threatened. Excessive freshwater discharges in the wet season and inadequate flows in the dry season threatened the estuaries and bays that are critical nurseries and home to many fish and wildlife species.

Getting the water right depends upon restoration of the region's hydrology and water quality. The right quantity of water, of the right quality, needs to be delivered to the right places and at the right times.

The strategy for restoration, project highlights, and a table detailing progress toward the measurable objectives for Goal 1 are on pages 5-12.



Goal 1: Get the Water Right

Subgoal 1-A:	**Get the Hydrology Right**
Objective 1-A.1:	Provide 1.8 million acre-feet of surface water storage by 2036.
Objective 1-A.2:	Develop alternative water storage systems capable of storing 1.7 billion gallons per day by 2030.
Objective 1-A.3:	Modify 361 miles of impediments to flow by 2020.
Subgoal 1-B:	**Get the Water Quality Right**
Objective 1-B.1:	Construct 96,010 acres of stormwater treatment areas by 2035.
Objective 1-B.2:	Prepare locally based plans to reduce pollutants as determined necessary by the total maximum daily loads by 2014.

The System Modifications diagram on the left depicts the historic ecosystem (pre-drainage flow and areal extent), the current flow (resulting from the C&SF Project and construction of extensive canals and levees), and the restored flow (following implementation of the CERP). (Graphic courtesy of the SFWMD and USACE.)

Subgoal 1-A: Get the Hydrology Right

The historic hydrology of the Everglades has been disrupted by flood control projects (e.g., canals and levees), agricultural use, and human development. Water that once slowly flowed across the River of Grass is now quickly diverted, impacting natural habitats including the region's sensitive estuaries. The CERP and other hydrology projects are being implemented to recapture most of this water and redirect it to sustain natural system functioning and to supplement urban and agricultural water supplies.

Strategy & Restoration Progress

This subgoal consists of three measurable objectives: surface water storage, alternative water storage, and removing impediments to flow. Progress on the measurable objectives during the reporting period (July 2010–June 2012) is described below and further delineated in the table on page 8. Additional hydrology efforts to help fulfill this subgoal are also described below.

Surface Water Storage Reservoirs

Strategy. Surface water storage impoundments will provide the ability to retain water until it is needed downstream, avoiding adverse unnatural pulses of freshwater to the estuaries and better mimicking flows in the region's core.

Progress. Approximately 9,000 acre-feet of storage and discharge capacity have been made available for interim water management benefits in the L-8 Basin area through the SFWMD-expedited construction of the L-8 Basin Reservoir. In addition, the design and final specifications for the state-expedited C-43 West Basin Storage Reservoir were completed in 2008. When completed, this reservoir will provide 170,000 acre-feet of storage. Other surface water storage projects are in various stages of planning and design as detailed in the table on page 8.

Alternative Water Storage

Strategy. Alternative water storage is needed to supplement the region's surface reservoirs. The original proposal in the CERP was utilization of extensive aquifer storage and recovery (ASR). Because of technical uncertainties identified with the ASR technology, pilot projects are underway to determine the viability of ASR to the extent needed to fulfill this objective.

Progress. Two pilot project facilities within this objective were constructed and are being tested. Although ASR has been used in local water storage for many years, there are technical uncertainties of using this technology at the regional scale envisioned in the CERP and it is being thoroughly researched through the ASR Regional Study and pilot projects. Modeling of the envisioned CERP ASR (333 wells) operations strategy has begun and will continue through 2013. The results of the pilot projects will be summarized in a Technical Data Report (TDR), which will be finalized in 2013. Further, contingency studies may be conducted after completion of the ASR Regional Study in 2013 to identify alternative storage and water supply options that ASR may not be able to address.

Exploratory wells around Lake Okeechobee provided data for the Lake Okeechobee, Hillsboro, and C-43 ASR pilot projects. Installation of the Kissimmee River ASR facility was completed in 2009; testing began in 2009 and will end in 2013. The Hillsboro ASR facility was completed in 2009; testing began in 2009 and will continue through 2012. A siting evaluation was completed and an exploratory well was constructed at the Seminole Tribe Brighton Reservation ASR well using streamside bank filtration. The Fisheating Creek Feasibility Study is in Phase 2 with evaluation and selection of a preferred plan underway.

Modifying Impediments to Flow

Strategy. Canals, internal levees, and other impediments will be removed or modified to reestablish the natural sheetflow of water through the system.

Progress. In addition to the following four projects currently underway, two projects for this objective, the East WCA 3A Hydropattern Restoration (Project ID 1304) and Kissimmee Prairie (Project ID 1305) projects, have been completed. Components of the Decomp Project Implementation Report (PIR) 1 (Miami Canal Backfill and Hydropattern Restoration Feature to spread water across the northern boundary of WCA 3) are now under evaluation in the CEPP. The Decomp Physical Model installation contract was awarded in May 2012. The first operational window is November – December 2012.

Subgoal 1-A: Get the Hydrology Right

Photo by Everglades National Park

Tamiami Trail. A groundbreaking ceremony for the Tamiami Trail Bridge was held in December 2009 for the Tamiami Trail Modifications portion of the Mod Waters project. It will raise (9.7 miles) and bridge (1 mile) portions of Tamiami Trail to accommodate higher water levels in the adjacent L-29 Canal and into ENP in the future when other conveyance, seepage management, and operating plans are in place. Roadwork construction began in March 2010. As of May 2012, all 478 piles have been driven, 67 pile caps completed, 92 beams spanning 80 feet in length installed, and over 2-miles of asphalt replaced on the roadway. This project is scheduled to be completed in December 2013. Construction of this bridge project sets the stage for future CERP components and operating plans that have potential to improve the quantity, quality, timing, and distribution of water deliveries to ENP, thereby supporting the recovery of wading bird populations, restoration of naturally occurring ridge and slough formation, restoration of fish and wildlife resources, and overall improvement of 63,000 acres of wetlands.

The National Park Service (NPS) Notice of Availability of the Draft Environmental Impact Statement (DEIS) was published in the Federal Register on May 25, 2010. The preferred plan identified in the DEIS would add 5.5 miles of bridging to the current 1-mile bridge under construction, increasing the total amount of bridge span within the 10.7-mile corridor to 6.5 miles. The Final Environmental Impact Statement (FEIS) for the Tamiami Trail Modifications: Next Steps project was completed with publication of the Notice of Availability in the Federal Register on December 14, 2010. The Record of Decision (ROD) was published in the Federal Register on April 26, 2011. On December 23, 2011, Congress passed the Consolidated Appropriations Act of 2012 which authorized construction of the Next Steps project: four bridges with a combined length of 5.5 miles. If the Tamiami Trail Modifications: Next Steps project is funded and implemented in conjunction with other planned restoration projects, ecological connectivity between the marshes located in the WCAs and ENP will be substantially improved.

In addition, with the passage of the Consolidated Appropriations Act of 2012, Congress appropriated $25 million for acquisition of commercial properties along Tamiami Trail authorized for acquisition by the 1989 Everglades National Park Protection and Expansion Act.

Kissimmee River. Natural flow has been reestablished for 13 of 22 miles of the historic meandering Kissimmee River. A total of 6,500 acres of floodplain wetlands have been restored and several species, including the ring-necked duck, American avocet, and black-necked stilt, have returned to the Kissimmee River after an absence of 40 years. Currently, the project is monitoring the success of 6 to 8 Caracara nests along reaches 2, 3, and 4 of the Kissimmee River Restoration project.

Southern Corkscrew Regional Ecosystem Watershed. Hydropatterns have been restored for approximately 640 acres of wetlands and exotic plants removed from over 2,560 acres for the Southern Corkscrew Regional Ecosystem Watershed (CREW) project.

C-111 (South Dade). This project will ultimately remove almost 5 miles of impediments and restore historic flows in the Taylor Slough and Eastern Panhandle areas of ENP, with downstream benefits for Florida Bay. The Taylor Slough bridge has been replaced, the C-109 canal has been backfilled, and parts of the C-111 spoil mound have been removed.

C-111 Spreader Canal West (Part 1). The SFWMD has completed expedited construction of the major features of the C-111 Spreader Canal Project, which will improve hydrology in the southern end of the system with expected benefits for wetlands and northeast Florida Bay from more natural flow patterns. The Final PIR was completed in January 2011 and the Chief's Report was signed in January 2012. The project is currently awaiting Congressional authorization.

Additional Efforts

Seepage Management. Projects will be implemented to maintain flood protection and reduce the loss of groundwater through seepage toward the east coast where groundwater levels were lowered by the C&SF Project to allow for development and other uses.

An agreement was signed in June 2010 to initiate the L-31 North (L-30) Seepage Management Pilot Project. This project provides for the testing of various technologies to prevent the loss of water from the natural system. However, this project requires an updated authorized total project cost in order to move forward with solicitation and award of the construction contract.

Operational Changes. Changes in water delivery management schedules will be made to alleviate extreme fluctuations and better match natural hydrological patterns while maintaining urban and agricultural water supply and flood control.

Subgoal 1-A: Get the Hydrology Right
Comprehensive Accomplishments July 2010–June 2012

Objective	Projects	Status
Surface Water Storage Reservoirs *Objective 1-A.1: Provide 1.8 million acre-feet of surface water storage by 2036.*	C&SF: CERP Indian River Lagoon–South (C-23/C-24/C-25/North Fork and South Fork Storage Reservoirs, and C-44 Basin Storage Reservoir) [Project ID 1101 and 1101A]	**Planning:** C44 design initiated for Phase 2. C23/25 – N+S design on hold until 2020. **Authorized for Construction:** WRDA 2007. **Construction:** Began in 2011, scheduled completion for IRL C-44 Reservoir/STA is 2020.
	C&SF: CERP Everglades Agricultural Area Storage Reservoir [Project ID 1102 and 1102A]	**Planning:** Re-initiated in 2011 and included in the CEPP.
	C&SF: CERP Lake Okeechobee Watershed [Project ID 1104]	**Planning:** Draft PIR currently on hold.
	C&SF: CERP Site 1 Impoundment [Project ID 1107 and 1107A]	**Planning:** Completed. **Authorized for Construction:** WRDA 2007. **Construction:** Began in October 2010.
	C&SF: CERP C-43 Basin Storage Reservoir, Part 1 (Caloosahatchee River (C-43) West Basin Storage Reservoir and Caloosahatchee Watershed) [Project ID 1109 and 1109A]	**Planning:** PIR completed. **Reports:** Chief's Report completed; awaiting Congressional authorization.
	Everglades and South Florida (E&SF): Critical Projects–Ten Mile Creek [Project ID 1111]	**Planning:** Completed. **Construction:** Physically completed. **Implementation:** Operational testing determined additional planning is needed.
	C&SF: Loxahatchee River Watershed Restoration Project (formerly North Palm Beach County–Part 1) [ID 1115]	**Planning:** Underway. **Construction:** Completed on several features through the SFWMD expedited program.
	C&SF: CERP Broward County Water Preserve Areas [Project ID 1116]	**Planning:** Final PIR was submitted to USACE Headquarters. Chief's Report signed May 2012, transmittal to Congress for authorization is expected by end of 2012.
Alternative Water Storage *Objective 1-A.2: Develop alternative water storage systems capable of storing 1.7 billion gallons per day by 2030.*	C&SF: CERP ASR Regional Study [Project ID 1203]	**Planning:** Interim report completed.
	Seminole Tribe Brighton Reservation Aquifer Storage and Recovery (ASR) Pilot Project [Project ID 1206]	**Planning:** Seeking Class V Well Injection Permit from the USEPA and SFWMD.
	Taylor Creek Aquifer Storage and Recovery (ASR) Project [Project ID 1207]	**Planning:** Completed pilot water treatment design studies and design for reactivation components. **Construction:** Completed; cycle testing ongoing.
	Fisheating Creek Feasibility Study [Project ID 1208]	**Planning:** Completed Phase I; underway for Phase II (plan selection)
Modifying Impediments to Flow *Objective 1-A.3: Modify 361 miles of impediments to flow by 2020.*	C&SF: C-111 (South Dade) [Project ID 1300]	**Planning:** Completed. **Construction:** Completed on several features.
	C&SF: CERP WCA-3 Decompartmentalization and Sheet-flow Enhancement [Project ID 1301]	**Planning:** Included in the CEPP in 2011. **Construction:** Physical Model contract awarded May 2012.
	E&SF: Critical Projects - Southern CREW [Project ID 1303]	**Land Acquisition:** Completed. **Planning:** Completed, design underway.
	Kissimmee River Restoration [Project ID 1306]	**Planning:** Completed. **Construction:** Underway; completed for 22 of 43 miles.
	Modified Water Deliveries to Everglades National Park [Project ID 1307]	**Planning:** Completed. **Construction:** Underway (Tamiami Trail Modification component began 2010, scheduled completion FY13; 8.5 Square Mile Area component structural modification underway to address mitigation requirements)
	Tamiami Trail Modifications: Next Steps [Project ID 1309]	**Planning:** Completed. ROD published April 2011. **Construction:** Authorized December 2011 and awaiting future appropriations.
	C&SF: CERP C-111 Spreader Canal [Project ID 2310 and 2310A]	**Planning:** PIR and Chief's Report completed; awaiting Congressional authorization. **Construction**: SFWMD completed construction of the recommended plan under its expedited construction program.

Subgoal 1-B: Get the Water Quality Right

Runoff from agriculture and stormwater from urban areas has impacted areas of the Everglades and Lake Okeechobee and impaired ecological functions in those critical ecosystems. Excess phosphorus is a major concern, but it is not the only problem. The Caloosahatchee and St. Lucie River and Estuaries, Biscayne Bay, Florida Bay, the Florida Keys, and nearshore coastal waters periodically show signs of impacts from nutrients, too little or too much fresh water, and agricultural or industrial pollutants such as copper and pesticides. Although nitrogen is of particular concern for marine systems, increased total phosphorus concentrations continue to trigger algal concerns in some estuaries, particularly Biscayne Bay and northeast Florida Bay. Mercury, resulting from atmospheric deposition, continues to be a concern in both freshwater and marine systems in south Florida. Potentially toxic contaminants, such as trace metals, pesticides, and other synthetic organic chemicals are found in certain soils, and sediments. This is of specific concern when former agricultural sites are used to construct water treatment and storage facilities associated with CERP.

Collaboration and cooperation between Florida and the USEPA lead to historic next step in Everglades restoration

To protect the Everglades' unique makeup of flora and fauna, the FDEP established a stringent phosphorus water quality standard of 10 parts per billion (ppb). Since then, the State of Florida has invested $1.8 billion in Everglades water quality improvements, moving toward achievement of the 10 ppb ambient water quality standard for the Everglades Protection Area (EPA).

In October 2011, Governor Rick Scott directed FDEP Secretary Herschel T. Vinyard Jr., and SFWMD Executive Director Melissa L. Meeker to work collaboratively with the USEPA to expand water quality improvement projects and achieve the ultra-low state water quality standard established for the Everglades.

In June 2012, the FDEP received notification from the USEPA stating the "permit revisions address our objections to prior permits received by USEPA and the State's plan meets the water quality goals in the September 3, 2010, Amended Determination (AD) and establishes an enforceable framework for ensuring compliance with the Clean Water Act and its applicable regulations." This action paves the way for the FDEP to move forward under the State's administrative processes to notice and successfully issue final permits and associated consent orders to implement this historic plan — including an achievable strategy and enforceable schedule for constructing an array of treatment projects and associated water storage — to improve water quality in the Everglades.

Strategy & Restoration Progress

The strategy for this subgoal consists of two measurable objectives: stormwater treatment areas (STAs) and water management plans. Progress on the measurable objectives during the reporting period (July 2010–June 2012) is described below and further delineated in the table on page 12. Additional water quality efforts that will help fulfill this subgoal are also described below.

Stormwater Treatment Areas

Strategy. STAs will reduce pollutants, including phosphorus, in waters entering the natural system from urban and agricultural areas.

Progress. Projects currently underway are detailed in the table on page x. The following six projects have been completed: STA-1 West Works and Outflow Pump Station (Project ID 1508), STA-2 Works and Outflow Pump Station (Project ID 1509), STA-3/4 Works (Project ID 1510), STA-5 Works (Project ID 1511), STA-6 (Project ID 1512), and Taylor Creek STA (Project ID 1112). Nubbin Slough STA will be put into operation later in 2012. More details on all these projects can be found in the *South Florida Environmental Report* (2010, 2011) at http://my.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports.

Water Management Plans

Strategy. Section 303(d) of the federal Clean Water Act requires states to submit lists of surface waters that still do not meet applicable water quality standards (impaired waters) after implementation of technology-based effluent limitations, and to establish total maximum daily loads (TMDLs) for these waters on a prioritized schedule. Implementation of TMDLs will involve a combination of regulatory, non-regulatory, and incentive-based actions to attain the necessary reduction in pollutant loading. The state of Florida has its own TMDL legislation; the Florida Watershed Restoration Act (F.S. 403.067) details the FDEP's role in implementing its TMDL program. One of the main mechanisms to implement the state of Florida's TMDLs are Basin Management Action Plans (BMAPs).

Progress. Beginning in 2009, after the development of TMDLs, the FDEP began kicking-off BMAP development meetings in the St. Lucie Estuary, Tidal Caloosahatchee, and Everglades West Coast basins. Currently, draft BMAPs are being prepared for the Tidal Caloosahatchee and the Everglades West Coast (for Hendry Creek and Imperial River) basins and the monitoring plans are being finalized. The BMAP process has included a detailed pollutant load allocation process for local stakeholders. Currently the FDEP is evaluating projects and initiatives submitted by stakeholders to meet their allocations. In addition, monitoring plans are being developed to track the success of the BMAPs as they are implemented in the future for the three areas. Project calculations are complete for all of the projects submitted by stakeholders. Most stakeholders have met their first phase reduction requirements. Consensus was reached on BMAP adoption language. The last BMAP meeting was held in December 2011 in conjunction with the SFWMD's River Watershed Protection Plan (RWPP) update meeting.

In the St. Lucie Estuary basin, project information has been collected and reviewed and there has been discussion among stakeholders to identify future and needed projects for prioritization and implementation. The FDEP and the SFWMD looked closely at land use, event mean concentration (EMC) values, and the draft load allocations for alignment with the St. Lucie River Watershed Protection Plan modeling efforts.

The 2012 updates were submitted to the Legislature in January and focused on the coordinating agencies' progress toward meeting each plan's goals since 2009 . The update also defines current and proposed nutrient reduction and storage projects that will require funding for implementation; and identifies the lead agencies for implementing each activity or project.

Under the Northern Everglades and Estuaries Protection Program (NEEPP) (373.4594, F.S.), the SFWMD, in collaboration with FDEP and the Florida Department of Agriculture and Consumer Services (FDACS) is required to create watershed protection plans for the Lake Okeechobee, Caloosahatchee River, and St. Lucie River watersheds. These plans are to protect and to restore surface water resources by addressing the reduction of pollutant loadings, restoration of natural hydrology, and compliance with applicable state water quality standards. Pollutant load reductions associated with the watershed protection plans are to be based upon TMDLs, which will serve as plan objectives. The original River Watershed Protection plans were completed in 2009 and the first updates were submitted to the Florida Legislature in 2012. More information is available at https://my.sfwmd.gov/northerneverglades.

Additional Efforts

State of Florida, Northern Everglades Initiative

Underscoring the state's commitment to Everglades ecosystem restoration, the Florida Legislature introduced the Northern Everglades Initiative (373.4594, F.S.), and provided a simplified and organized approach to focus on the full scope of Everglades restoration in the context of the northern and southern regions of the Everglades system. A watershed source control program to control pollutants at the source before they enter water bodies related to the northern and southern Everglades is integral to the restoration efforts for the Greater Everglades ecosystem.

The Northern Everglades Initiative was brought about by substantial changes to the Surface Water Improvement and Management (SWIM) legislation associated with the Lake Okeechobee, Watershed through the passage of the Lake Okeechobee Protection Act (LOPA) of 2000 and 2004 [Section 373.4595, Florida Statutes (F.S.)] and the 2007 amendments to the statute. With the 2007 amendment, the Florida Legislature substantially expanded LOPA to include protection and restoration of the Lake Okeechobee, the Caloosahatchee, and St. Lucie River watersheds and their estuaries. These plans are expected to augment restoration currently underway in the Everglades south of Lake Okeechobee and build on ongoing restoration efforts north of Lake Okeechobee and in the river watersheds by identifying and implementing programs and projects necessary to achieve water quality and quantity objectives for the watersheds.

The NEEPP further defined the role of the coordinating agencies with regard to FDACS for implementation of non-point source best management practices (BMPs) on agricultural lands and the FDEP for implementation of source control programs primarily targeting urban and non-agricultural issues throughout the entire NEEPP watershed area.

The Lake Okeechobee Watershed Construction Project Phase II Technical Plan was submitted to the Legislature in February 2008 and, is currently being implemented. This technical plan identifies construction projects, along with on-site measures that prevent or reduce pollution at its source, such as agricultural and urban BMPs, needed to achieve the Lake Okeechobee TMDL. In addition, the plan includes other projects for increasing water storage north of the lake to achieve healthier lake levels and reduce harmful discharges to the Caloosahatchee and St. Lucie river estuaries.

Subgoal 1-B: Get the Water Quality Right

Tribal Water Quality Standards. In May 1999 the USEPA approved the 10 micrograms per liter (10 µg/L) total phosphorus water column quality standard adopted by the Miccosukee Tribe of Indians of Florida. The tribe, which is treated as a state for purposes of the Clean Water Act, adopted water quality standards to protect the tribal Everglades under their jurisdiction on the Federal Reservation. The Seminole Tribe is working to develop numeric nutrient criteria by 2015, making Public Notice in 2016 and submitting to USEPA for approval in 2017.

Florida Keys National Marine Sanctuary (FKNMS). In October 2011, the first Condition Report for the FKNMS was released. While there are some areas for concern, there are many areas where improvements in the condition of sanctuary resources are noted. The report can be accessed at http://floridakeys.noaa.gov/scipublications/condition.html. In addition, the sanctuary, along with its advisory council, local, state, and federal partners, recently launched a marine zoning and regulatory review. More about this initiative can be found at: http://floridakeys.noaa.gov/

Florida Keys National Marine Sanctuary Water Quality Protection Program (FKNMSWQPP). The USEPA, the National Oceanic and Atmospheric Administration (NOAA), the Florida Fish and Wildlife Conservation Commission (FWC), and the FDEP conduct a comprehensive water quality monitoring and research program that that monitors water quality, seagrasses, and corals within the sanctuary. The program also takes corrective actions to address point and nonpoint sources of water pollution in sanctuary waters to help sustain healthy populations of animals and plants. Major advancements have been made in wastewater treatment in recent years. To date, approximately 70% of the previously reported cesspits and septic tanks have been replaced with advanced wastewater treatment facilities from Key Largo to Key West. Parts of Islamorada and the Big Pine to Cudjoe Key area are scheduled to be retrofitted by 2015.

In December 2010, the FKNMS implemented a Marine Sanitation Device No-Discharge regulation that prohibits the discharge of sewage from a vessel's marine sanitation device into sanctuary waters. This action complements the USEPA and State of Florida rule that applies in state waters under the Clean Water Act. While advancements have been made in reducing nutrient inputs from the islands themselves, water quality monitoring studies show that surface waters are affected by sources that originate outside of the Keys. Masses of nutrient-rich fresh waters discharged from rivers along Florida's southwest coast and Gulf of Mexico can move southward where they can impact the coral reefs on the ocean side of the Keys.

The FKNMSWQPP Steering Committee has formed a working group focused on improving water flows and circulation in residential canals and marinas. The working group has identified and prioritized a list of canals that are in need of improvement. This will reduce the accumulation of seaweed wrack which decomposes and affects the water quality in dead-end canals. Many of the fixes are of engineering in design and construction.

On February 7, 2012, The FDEP adopted the Florida Keys Reasonable Assurance Plans (RAP) by Secretarial order:
"This RAP was developed by the Department in cooperation with local governments, state agencies, and federal agencies within the Florida keys to set forth and accelerate the actions to reduce nutrient loadings to near shore waters throughout the Florida Keys so that water quality standards are met and beneficial uses are restored. In addition to the recent adoption of these Reasonable Assurance documents, the Department will be submitting these reports to USEPA for acceptance with the submittal of the Group 5-Cycle 2 assessment updates to Florida's 303(d) list *(http://www.dep.state.fl.us/water/watersheds/bmap.htm)*.

Best Management Practices. BMPs include structural and management practices on agricultural and non-agricultural lands that will improve or maintain the health of natural resources including water quality.

While the Florida Watershed Restoration Act (Section 403.067. F.S.) enacted in 1999 authorized the FDACS to develop, adopt by rule and implement agricultural BMPs statewide, the Northern Everglades and Estuaries Protection Program (NEEPP) authorizes the FDACS to initiate rule development for BMPs, conservation plans, nutrient management plans, or other measures necessary for nutrient reduction in the Northern Everglades watershed.

Under the NEEPP authority, the FDACS has adopted, and recently revised, Chapter 5M-3, F.A.C., which requires agricultural producers in the Northern Everglades to implement BMPs in applicable FDACS manuals, develop and implement a conservation plan, or monitor their water quality under the SFMWD's Works of the District (WOD) program to demonstrate compliance with state water quality standards.

The FDACS has adopted BMP manuals for most agricultural commodities, both regionally and statewide. Examples of these are manuals for cow/calf, vegetable, and agronomic crops, Indian River Citrus, and Ridge Citrus operations. The rule also provides criteria for the land application of animal manures.

The FDACS, along with the Florida Farm Bureau, Florida Cattleman's Association, and University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) extension services hold cow/calf BMP workshops in Polk, Osceola, Hendry, and Glades counties. Additionally, the FDACS has an urban turf fertilizer rule, which regulates fertilizer application to residential yards. The FDEP continues to implement its various regulatory programs to address urban stormwater and other nonpoint source inflows into the St. Lucie River and Caloosahatchee River Watersheds. One of the agency's most productive and cost-effective methods to protect surface waters is the use of educational outreach and partnering with other state and local agencies to encourage behavioral changes. The FDEP continues to utilize public education in the river watersheds as a means to promote common sense, low-cost measures for reducing nutrient pollution that enters stormwater in urbanized areas through non-structural BMPs [e.g., more efficient fertilizer use, lawn and landscape management (in cooperation with UF/IFAS), urban stormwater management practices, etc.]. In addition, the FDEP is continuing its work with local governments where needed to provide technical assistance in the development and updating of wastewater and stormwater master plans to reduce nutrient inputs to the coastal environment. For more information, please visit http://www.dep.state.fl.us/water/nonpoint/pubs.htm.

Subgoal 1-B: Get the Water Quality Right
Comprehensive Accomplishments July 2010–June 2012

Objective	Projects	Status
Stormwater Treatment Areas *Objective 1-B.1: Construct 96,010 acres of stormwater treatment areas by 2035.*	E&SF: Critical Projects Lake Okeechobee Water Retention/Phosphorus Removal [Project ID 1506]	**Planning:** Completed. **Construction:** The approximately 800-acre Nubbin Slough project is scheduled to be transferred to sponsor in Sept. 2012 for operations. The approximately 200-acre Taylor Creek project was transferred to sponsor for operations in 2011.
	C&SF: West Palm Beach Canal STA-1E / C-51 West [Project ID 1513]	**Planning:** Completed. **Construction:** Task Orders 1, 2, & 3 are underway for culvert repairs. S-375 work is complete, Decommissioning of PSTA site initiated in May 2012 and will be complete in May 2013.
	State Expedited Project: Everglades Agricultural Area (EAA) STAs Built-out Expansion [Project ID 1514A]	**Construction:** Completed for initial Phase EAA Compartment B, Compartment C STAs, and C-139 Annex Pump. Construction of additional 11,500 acres to be completed in July 2012.
	State Expedited Project: Lakeside Ranch STA (part of the Northern Everglades Project) [Project ID 1515]	**Planning:** Completed for Phase I (STA North). **Construction:** Underway for 950 acre Phase I. Will be completed in 2012 (STA-N and S-650).
	C-43 Water Quality Treatment Area and Test Facility [Project ID 1519]	**Planning:** Conceptual design for the test facility will be completed by the end of 2012.
	Long-Term Plan for Achieving Everglades Water Quality Goals [Project ID 1520]	**Planning:** Revisions to the plan approved by FDEP. Anticipated expansion includes additional STA treatment wetlands and construction of flow equalization basins upstream of STA.
Water Management Plans *Objective 1-B.2: Prepare locally based plans to reduce pollutants as determined necessary by the total maximum daily loads by 2014.*	Total Maximum Daily Load for South Florida [Project ID 1600]	**Planning:** Completed for St. Lucie Basin (nutrients, dissolved oxygen), Caloosahatchee Estuary (nutrients), Everglades West Coast Basin (nutrients, dissolved oxygen, fecal coliforms).
	Hybrid Wetland Treatment [Project ID 1723]	**Planning:** Completed. **Construction:** Completed for three sites (Lemkin Creek, Wolff Ditch, and Phase 1 of Grassy Island) **Implementation:** Completed for two sites (Lemkin Creek and Wolf Ditch)
	Local Cost-Share Projects with Martin County [Project ID 1724]	**Planning:** Completed **Construction**: Construction is substantially complete for Old Palm City Stormwater Quality Improvement Project and Manatee Pocket Dredging and Manatee Creek Stormwater Improvement Project.

Photo by Jose Cabaleiro

Goal 2: Restore, Preserve, & Protect Natural Habitats & Species

Historically the natural habitats of south Florida covered an area of about 18,000 square miles. This enormous space encompassed a rich mosaic of ponds, sloughs, sawgrass marshes, hardwood hammocks, and forested uplands. In and around the estuaries, freshwater mingled with salt to create habitats supporting mangroves and nurseries for wading birds and fish. Beyond, nearshore islands and coral reefs provided shelter for an array of terrestrial and marine life. The vast expanses of habitat were large enough to support far-ranging animals, such as the Florida panther, and super colonies of wading birds, such as herons, egrets, roseate spoonbills, ibis, and wood storks. For thousands of years this resilient ecosystem withstood and repeatedly recovered from the effects of hurricanes, fires, severe droughts, and floods, retaining some of the greatest biodiversity found on earth.

A combination of connectivity and spatial extent created the range of habitats and supported the levels of productivity needed for the historic diversity and abundance of native plants and animals. Restoring natural habitats and species will require reestablishing the hydrologic and other conditions conducive to native communities and piecing together large enough areas of potential habitat. Exotic species must be managed, and the escape of new exotics must be prevented.

The strategy for restoration, project highlights, and a table detailing progress toward the measurable objectives for Goal 2 are on pages 14-22.

Goal 2: Restore, Preserve, & Protect Natural Habitats & Species

Subgoal 2-A: Restore, Preserve, & Protect Natural Habitats

Objective 2-A.1: Complete acquisition of 5.7 million acres of land identified for habitat protection by 2020.

Objective 2-A.2: Protect 20 percent of the coral reefs by 2015.

Objective 2-A.3: Improve habitat quality for 2.4 million acres of natural areas in south Florida.

Subgoal 2-B: Control Invasive Exotic Plants & Animals

Objective 2-B.1: Achieve maintenance control of Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern on south Florida's public conservation lands by 2020.

Objective 2-B.2: Release two biological control insects per year for the control of invasive exotic plants.

Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2014.

Subgoal 2-A: Restore, Preserve, & Protect Natural Habitats

Currently, the Florida panther and 68 other animal or plant species which inhabit south Florida are listed by the U.S. Fish and Wildlife Service (FWS) as threatened or endangered. Many additional species are of special concern to the State of Florida. Super colonies of wading birds no longer nest in the Everglades. The wetland habitats that supported these species have been reduced by half, fragmented by roads, levees, and other structures, dewatered by canals, and degraded by urban and agricultural pollutants. The marine environments of the bays and coral reefs have suffered a similar decline. Restoration will require land acquisition to protect natural habitats and species, protection of the region's offshore habitats including coral reefs, and the improvement of the quality of these natural areas. Restoration will also depend upon the successful control of invasive exotic plants and animals.

Strategy & Restoration Progress

The strategy for Subgoal 2-A consists of three measurable objectives: land acquisition, coral reef protection, and habitat improvement. Progress on the measurable objectives during the reporting period (July 2010–June 2012) is described in this section and further delineated in the table on page 18. Additional efforts that will help fulfill this subgoal are also described below.

Land Acquisition

Strategy. Land will be acquired to preserve habitat for native plants and animals and to act as a buffer to existing natural areas. Land will also be acquired for water quality treatment areas, water storage reservoirs, and aquifer recharge areas that will help restore the natural hydrology. Fee-simple acquisition will be coupled with alternative tools to meet restoration land use needs while maximizing the benefits of limited fiscal resources.

Progress. Of the 72 land acquisition projects, 11 are completed and 51 are underway with almost 4.9 million acres acquired to date. The FDEP acquired just over 1,341 acres in south Florida during this reporting period. 1,237 acres were acquired through donation, 64 acres were acquired through tax deed sales, and 40 acres were fee acquisitions.

Photo by Brent Anderson

Goal 2-A: Restore, Preserve, & Protect Natural Habitats

The Florida Forever Program is Florida's primary land acquisition program. The 10 year, $3 billion program was established in 2000 by the Florida Legislature to conserve environmentally sensitive land, restore waterways, and preserve important cultural and historical resources. Florida Forever is the successor to Preservation 2000. The 2008 Legislature authorized an additional $3 billion through 2020.

Coral Reef Protection

Strategy. Restoring and preserving off-shore habitat involves restoring more natural timing and delivery of freshwater flows to coastal estuaries, which are critical to the life-cycles on many reef fish, as well as the protection of critical coral reef communities in the FKNMS, Dry Tortugas National Park and Biscayne National Park (BNP). Reef habitat protection involves a variety of management tools designed to increase biological and benthic integrity, which range from size and bag limit restrictions, to gear restrictions, to the establishment of areas which are closed to extractive activities.

Progress. Ecological monitoring continues throughout the sanctuary. A report documenting five years of monitoring and study in the Dry Tortugas National Park Research Natural Area (RNA) was released in 2012 by FWC and the NPS (http://www.nps.gov/drto/naturescience/index.htm). The results suggest that the RNA has played a substantive role in enhancing exploited reef fish species populations. Continued collaboration of the FWC and NPS, together with other partners, will facilitate long-term research and monitoring to fully understand the benefits of the RNA. Results from these monitoring studies and other research programs will be essential to guiding managers in the implementation of appropriate management tools. Restoration of degraded or damaged coral reefs is also underway. BNP is also developing updates to its fisheries management and general management plans.

Habitat Improvement

Strategy. The CERP calls for removing barriers to sheetflow, restoring more natural hydro-periods to wetlands, and providing natural system water flows to coastal waters. These projects will restore hydrological connections to large portions of the remnant Everglades marsh, improve water quality, and increase the extent of wetlands, thus enhancing fish and wildlife habitat. Wetlands enhancement will also be achieved through voluntary conservation efforts to restore, enhance, and protect degraded wetlands on agricultural lands.

Progress. Picayune Strand Restoration. A groundbreaking was held for the Picayune Strand Restoration Project Faka Union Pump Station and Phase III Road Removal in February 2011 with anticipation of completion in 2014. Construction continued on the Merritt Pump Station and Phase II Road Removal and will be completed in 2013. This project will restore 55,000 acres of hydrology and habitat in southwest Florida. It was authorized for construction in WRDA 2007 and the USACE and SFWMD signed a Project Partnership Agreement for construction of the project in August of 2009. Early restoration work on the Prairie Canal feature was completed by the SFWMD and the USACE has initiated construction of the Merritt and Faka Union pump stations and road removal features under the Project Partnership Agreement. The Miller Pump Station is scheduled to be awarded in 2013. Analysis is underway to determine the effects of the surface water to adjacent lands. If any effects are determined, protection features must be installed before plugging the existing canals. Based on the Corps' current fully funded project cost estimate, completion of all remaining project features would result in exceeding the section 902 limit. The Corps plans to continue construction of features that can be accomplished within its current spending authority, and complete a Post-authorization Change-Limited Reevaluation Report to request authority for a project cost increase.

Lakes Park Restoration. Construction began at Lakes Park in February 2012 and is anticipated to be complete this year. The objective of this project is to improve water quality treatment in Lakes Regional Park and enhance water quality in receiving waters of Hendry Creek and Estero Bay. Improvements include construction of a 40-acre marsh/flow-way.

Goal 2-A: Restore, Preserve, & Protect Natural Habitats

Acme Basin B. The SFWMD worked with local interests to expedite design and construction of the Acme Basin B Discharge Project outside of the CERP. This project helps to improve water quality in the Everglades by diverting urban stormwater runoff into the Section 24 Impoundment for peak flow attenuations, then into the C-51 canal for final delivery to STA-1E for final treatment. The project included construction of two new pump stations and improvements to the C-1 canal. Phase II was completed in July 2010, and on November 12, 2010, the dedication of the Acme Basin B Discharge project was held.

Biscayne Bay Coastal Wetlands. The Final PIR for the Biscayne Bay Coastal Wetlands Project was completed in December 2011 and the Chief's Report was signed in May 2012. The Chief's Report is under review by the Office of Management and Budget (OMB) and the signed Record Of Decision is expected in August 2012.The SFWMD completed construction on hydrologic improvements on the Deering Estate wetland rehydration component of the project in January 2012 and installed four of the ten culverts planned for the L-31-East component to distribute water more naturally to coastal wetlands.

Additional Efforts:

There are numerous federal, state, and local government programs, and cooperating non-governmental organization (NGO) programs that could potentially be utilized in support of land acquisition and conservation. Many of these programs provide opportunities to match or leverage funding available through other sources for land acquisition, conservation, or restoration. Land conservation can be achieved through various methods, including:

· Fee purchase
· Easement purchase
· Easement donation
· Purchase of development rights
· Mitigation banks
· Outright land donation

Photo by Brent Anderson

Goal 2-A: Restore, Preserve, & Protect Natural Habitats

Leveraging Limited Funds. Increasingly, land conservation will rely on collaborative efforts to protect vital wildlife habitats through community-based coalitions of private landowners, conservation groups, and state, local, and federal agencies. One such collaborative management tool is conservation banks. Conservation banks are like a biological bank account. Instead of money, a habitat owner has conservation credits to sell. Another tool, conservation easements, involve purchasing a portion of the rights associated with the land to provide some degree of protection to natural resources on the land.

Northern Everglades and Southwest Florida Cooperative Conservation Blueprint Regional Pilot Project. The FWC initiated this program to support maintaining agricultural lands in private ownership and producing an economic return for environmental services while protecting valuable wildlife habitats and providing lower cost, natural systems solutions to public infrastructure needs. More information is available at: http://myfwc.com/media/1493861/BlueprintPilotFlyerFinal.pdf.

Photo by Carlton Ward

Everglades Headwaters National Wildlife Refuge. The USFWS is leading the planning efforts for the Everglades Headwaters National Wildlife Refuge to protect 150,000 acres of conservation lands through a combination of fee simple acquisition and easements or less-than-fee instruments in the Northern Everglades Watershed to establish a new national wildlife refuge in Florida. This project is part of a multi-phase project called the Greater Everglades Partnership Initiative and would protect habitat for 88 federal and state listed species concern including the Florida Panther, the Florida black bear, and the Florida scrub jay while also providing compatible recreation opportunities as part of America's Great Outdoors Initiative. This refuge would be one of the first established to address climate change as well as protect species and contribute to Everglades watershed restoration while fostering the state's rural ranching heritage. Multiple partners at the federal, state, and county level are involved along with several NGOs.

Goal 2-A: Restore, Preserve, & Protect Natural Habitats

Subgoal 2-A: Restore, Preserve, and Protect Natural Habitats Comprehensive Accomplishments July 2010–June 2012		
Objective	**Projects**	**Status**
Land Acquisition Objective 2-A.1: Complete acquisition of 5.7 million acres of land identified for habitat protection by 2020.	Land Acquisition Projects [Project IDs 2100-2171]	**Real Estate:** 4,883,640 acres of the 5,667,918 acres (86%) have been acquired to date at a cost of $3.7 billion
Coral Reef Protection Objective 2-A.2: Protect 20 percent of the coral reefs by 2015.	Florida Keys National Marine Sanctuary has initiated a marine zoning and regulatory review. Scoping meetings are scheduled for June 2012 and public comments are being accepted through June 29, 2012. BNP has been developing updates to its fisheries and general management plans.	**Implementation:** Ecological monitoring underway; marine zoning and regulatory review underway
Habitat Improvement Objective 2-A.3: Improve habitat quality for 2.4 million acres of natural areas in south Florida.*	C&SF: CERP Lakes Park Restoration [Project ID 2302]	**Construction:** Began February 2012; improvements include construction of a 40-acre marsh/flow-way
	Arthur R. Marshall Loxahatchee National Wildlife Refuge Prescribed Fire Program [Project ID 2304]	**Implementation:** Ongoing
	C&SF: CERP Acme Basin B Discharge [Project ID 2306 and 2306A]	**Construction:** Completed construction of Pump Station #7 and C-1 canal conveyance improvements and Section 24 Impoundment
	C&SF: CERP Picayune Strand Restoration [Project ID 2307]	**Planning:** PIR and Chief's Report completed, PAC LRR to be completed in March 2013. **Construction:** Prairie Canal Phase I & road removal completed, Merritt Pump Station Phase II & road removal to be completed 2013, Faka Union Pump Station Phase III & road removal to be completed 2014, Merritt Pump Station Phase IV & road removal to be awarded in 2013 and completed in 2017.
	C&SF: CERP Biscayne Bay Coastal Wetlands [Project ID 2309 and 2309A]	**Planning:** PIR and Chief's Report completed ; review by OMB ongoing **Construction:** SFWMD completed construction of L-31E Culverts and Deering Estate Flow-way projects
	C&SF: CERP C-111 Spreader Canal [Project ID 2310 and 2310A]	**Planning:** PIR and Chief's Report completed; awaiting Congressional authorization **Construction:** SFWMD completed construction of the recommended plan under its expedited construction program

* The April 1999 USACE *C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement* included an extensive environmental evaluation of the likelihood of CERP in meeting planning objectives for both spatial extent and habitat quality improved through implementation of the CERP projects. Table 7-18 of that publication identifies in detail the anticipated effectiveness of various alternative plans in meeting the CERP planning objectives on a sub-regional basis. The projects included in this table are examples, not a comprehensive list, of how this objective will be achieved.

Subgoal 2-B: Control Invasive Exotic Plants & Animals

Photo by Everglades National Park

The control of invasive exotic species is integral to the restoration of the ecosystem and to the recovery of threatened and endangered and other imperiled species. Some invasive exotic plants and animals have spread in natural areas to the extent that the native plant and animal communities are being threatened or replaced. Even a small and seemingly innocuous species such as the Cuban treefrog has adversely affected native treefrogs in some areas of the ENP.

The unregulated importation of new plant and animal species continues to increase the potential for infestations of exotic species. Continuing degradation of the natural environment may enhance the spread or the rate of spread of exotic species. Although control of exotic plants on public lands is progressing, the success will be impacted if adjacent private lands remain infested. In addition, the level of effort varies from agency to agency (federal, state, and local), therefore continuous coordination between the agencies is required to maximize benefits. To address these threats, and especially to prevent new invasions, will require broad partnerships and substantial resources.

Exotic species must be managed, new infestations must be detected early and removed, and the introduction of new exotics must be prevented. Then it will require time for native plants and animals to reestablish populations and communities. The intended result is self-sustaining populations of diverse native animal and plant species.

Strategy & Restoration Progress

The strategy for Subgoal 2-B consists of three measurable objectives: maintenance control of invasive exotic plant, biological control of invasive exotic plants, and control of invasive exotic animals. Progress on the measurable objectives during the reporting period (July 2010–June 2012) is described below and further delineated in the table on page 22. Additional efforts that will help fulfill this subgoal are also described below.

Maintenance Control of Invasive Exotic Plant

Strategy. Maintenance control is defined as "a method for the control of exotic plants in which control techniques are utilized in a coordinated manner on a continuous basis in order to maintain the plant population at the lowest feasible level" (§369.22, *Florida Statutes*). Many techniques will be used in an integrated approach to achieve maintenance control of invasive exotic plants including mechanical removal, chemical treatment, and biological controls.

Progress. Regional, coordinated efforts have yielded the EPA largely free of melaleuca. Much of the remaining population is now found on private lands. In close collaboration with the NPS, the SFWMD continues its invasive species monitoring program for the EPA. Using aerial and ground-based techniques, the SFWMD and the NPS are collecting operationally useful spatial data for priority invasive plant species. There is now detailed information of major infestations throughout the entire 2.4 million-acre Everglades region.

(See Quantifying Region-Wide Nonindigenous Plant Infestations using Digital Aerial Sketch Mapping in http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2011_sfer/v1/chapters/v1_ch6.pdf)

Within the LNWR, treatment programs continue for invasive exotic plants, which include melaleuca, Old World climbing fern (*Lygodium microphyllum*), Brazilian pepper (Schinus terebinthifolius) and Australian Pine (*Casuarina equisetifolia*). Currently, Australian pine and Brazilian pepper are in maintenance control. As a result of increased funding and systematic control efforts significant progress in the control of melaleuca also has been made in the last three years. It too will be within maintenance control within the next few years. Control efforts for Old World climbing fern con-

sist of restricting the spread of the invasive plant while more efficient and effective methods of control are developed. Knowledge gained from both operational experience and recent herbicide trials allows the SFWMD and partner agencies to more effectively treat priority invasive plant species. Ongoing integrative management evaluations for aquatic and terrestrial invasive plants have yielded significant improvements in management outcomes. For example, SFWMD scientists and collaborators from the University of Florida are conducting research to evaluate herbicide resistance and selectivity among invasive aquatic weeds that are common in Everglades STAs. Seven recently approved aquatic herbicides and three experimental use herbicides are being tested in STA test cell ponds to determine efficacy and selectivity profiles for undesirable invasive plants in STAs.

Non-native (exotic) plants are a significant threat to the native plant communities of ENP, most of which is a designated wilderness. Of the approximately 1,000 plant species recorded in the park, over 220 species are non-native. Current funding supports the systematic treatment to address 10 to 15 species, including Brazilian pepper, Melaleuca (*Melaleuca quinquenervia*), Australian pine, Lather leaf (*Colubrina asiatica*), and Old World climbing fern. Exotic vegetation is estimated to affect approximately 200,000-250,000 acres of the park. Over the last 20 years, funds provided by federal, state, and county agencies have helped to treat exotic vegetation in ENP.

In addition, the Hole-in-the-Donut project seeks to restore over 6,300 acres of wetlands within ENP by removing Brazilian pepper and disturbed substrate down to limestone bedrock as mitigation for development projects in other areas of Miami-Dade County. As of 2010, more than 4,414 acres have been restored.

Biological Control of Invasive Exotic Plants

Strategy. Plants are often prevented from becoming serious weeds in their native range by a complex assortment of insects and other herbivorous organisms. “Classical” biological control efforts will locate such insects and import host-specific species to attack and control the plant in regions where it has become a weed.

Progress. The SFWMD continued to support development of biological control agents for melaleuca, Old World climbing fern, and Brazilian pepper during the reporting period. The USDA Agricultural Research Service (ARS) has developed several successful biological control agents for melaleuca and one for Old World climbing fern. One additional biological control agent is awaiting permit approval: *Neostromboceros albicomus,* a Thai sawfly that attacks Old World climbing fern. Recent testing of *Liliocerus cheni*, a leaf beetle from Nepal that causes serious defoliation of air potato (*Dioscorea bulbifera*) vines, suggests that this insect is highly specific to air potato and is likely to be approved for release in the near future. Release efforts were underway in 2011. In addition to these weed targets, biological control research is focused on Brazilian pepper, hydrilla, carrotwood (*Cupaniopsis anacardioides*), skunk vine (*Paederia foetida*), water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), wetland nightshade (*Solanum tampicense*), Jamaican nightshade (*Solanum jamaicense*), lobate lac scale (*Paratachardina pseudolobata*), and the bromeliad weevil (*Metamasius callizona*).

Photo by Jose Cabaleiro

The SFWMD and the USACE are implementing a partnership agreement to build a 2,700 square-foot annex to the existing USDA/ARS research laboratory to mass rear and release approved biological control agents targeting priority invasive plants. Final design review for the Mass Rearing Facility was completed and the Notice to Proceed for construction was issued in August 2011. Construction of the facility began in October 2011 and is scheduled for completion in December 2012.

Control of Invasive Exotic Animals

Strategy. Invasive animal species are a rapidly increasing environmental and economic problem in the United States. According to USFWS records, legal wildlife shipments into the United States between 1999 and 2010 comprised over 2.8 billion individual exotic animals, representing at least 4,200 different species from over 150 countries. Florida now ranks as having the largest number of established non-indigenous herpetofaunal species in the entire world. Fifty-six are established including three frogs, four turtles, one crocodilian, 43 lizards, and five snakes.

Controlling invasive exotic animals requires a complex suite of prevention, detection, eradication, and monitoring projects. One example is the effort to eradicate the Gambian pouch rat from the Florida Keys and thus prevent the spread of this species throughout the South Florida Ecosystem. Multiple efforts are focused on eradicating a variety of giant constrictors that pose a significant threat to the ecosystem’s native species.

Burmese pythons (*Python molurus bivittatus*) are now a prominent component of the vertebrate biomass of the Everglades, and may be responsible for suppression of a number of native species. More research is required in order to quantitatively evaluate the impacts of these invasive reptiles and amphibians, and to determine the best way to manage and control their populations. The odds of eradicating an introduced population of reptiles once it has spread across a large area are very low, pointing to the importance of prevention, early detection, and rapid response.

Subgoal 2-B: Control Invasive Exotic Plants & Animals

Progress. Intensified efforts to develop control tools and management strategies for several priority species continued during this period. These include the Burmese python (*Python molurus bivittatus*) and other giant constrictors, the Nile monitor (*Varanus niloticus*), and the Argentine black and white tegu (*Tupinambis merianae*).

- An interagency collaboration was initiated in 2010 to monitor priority invasive reptiles and amphibians and their impacts within the Greater Everglades ecosystem. The Everglades Invasive Reptile and Amphibian Monitoring Project (EIRAMP) seeks to establish a systematic monitoring program throughout the Everglades in order to assess populations across the landscape.
- To date, over 1,800 documented Burmese pythons have been removed from south Florida.
- In January 2012, the USFWS listed the Burmese python and several other large constrictor snakes (the northern and southern African python and the yellow anaconda) as injurious species under the Lacey Act. By this action, the importation into the United States and interstate transportation between states, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States of any live animal, gamete, viable egg, or hybrid of these four constrictor snakes is prohibited, except by permit for zoological, education, medical, or scientific purposes (in accordance with permit regulation). (For more information, please visit http://www.fws.gov/invasives/news.html.)
- During 2010-2011, a collaborative effort involving the ENP, Auburn University, SFWMD, NPS and others sought to evaluate canine detection as a potential tool for python management. Results of this pilot project showed that detection dogs may be an effective tool for python monitoring and removal in certain circumstances, particularly along levees and canals. (For more information, please visit http://www.evergladescisma.org/summit11/22_RomagosaEvergladesSummit20111.pdf.)
- In June 2011, the SFWMD executed a Memorandum of Agreement with the FWC which established a modified permitting program that continues to be administered by the FWC. New permits are designed to make exotic reptile removal easier and more effective by opening additional land owned by SFWMD, providing better access, and allowing use of a greater range of weapons, including guns for the first time.
- Since October of 2010 the NPS has invested over $1 million in cooperative endeavors to control the Burmese python and reduce the risk of introduction of other invasive animal species. (For more information, please visit http://www.nps.gov/ever/naturescience/npspythonmanagement.htm.)
- The FWC began its python removal program in 2009. Twenty-three qualified individuals have been permitted to search for and remove Burmese pythons, as well as other specified nonnative snakes and lizards on four FWC wildlife management areas. More than sixty pythons of all sizes were killed in the first two years.

Additional Efforts

Everglades Cooperative Invasive Species Management Area. A cooperative interagency effort to manage and control exotics species was formalized in 2008. A memorandum of understanding was signed by the partner agencies of the Everglades Cooperative Invasive Species Management Area (Everglades CISMA): SFWMD, USACE, FWC, NPS, Miami-Dade County, and USFWS. The Everglades CISMA focuses on early detection and rapid response of emerging threats.

This grass-roots interagency group has developed a strategy for approaching invasive species problems in the Everglades that follows well-established, internationally accepted elements at the field-level. The major components of the invasive animals strategy are: 1) prevention and assessment of new invasive species, 2) management and control of established invasive species such as the Burmese python, 3) education and outreach, and 4) interagency coordination and planning.

Since its inception, the group has achieved much progress toward improved coordination and cooperation among those engaged in invasive species management in the Everglades. These accomplishments include development of regional monitoring programs, standardization of data management, completion of numerous rapid response initiatives, and enhanced coordination of management and research activities. In addition to continued coordination and collaboration on long-term management efforts for melaleuca, Old World climbing fern, and other widely established species, Everglades CISMA participants organized efforts to address recently discovered populations of nonindigenous species. These include rapid assessment efforts to determine the current status of tegu lizards in the southeastern region of the Everglades, rapid response efforts to control populations of mile-a-minute weed, and continued monitoring and treatment of the invasive mangrove species *Luminitzera racemosa*.

Subgoal 2-B: Control Invasive Exotic Plants & Animals

Everglades CISMA members also worked with the SCG during 2010 to discuss next steps for addressing the impacts of nonindigenous, invasive species in the Everglades restoration footprint. Recommendations were presented to the Task Force on October 28, 2010 which focused on four main areas: (1) promoting federal prevention initiatives for nonnative wildlife, (2) establishing a position for an Everglades Early Detection/Rapid Response (EDRR) coordinator and dedicated EDRR funding, (3) coordinating development of a cross-cut budget for invasive species, and (4) promoting continued improvements to coordination. More information about the Everglades CISMA is available at www.evergladescisma.org.

Invasive Exotic Plant Efforts. Both the Picayune Strand Restoration and Site 1 Impoundment projects have completed and approved Vegetation Management Plans. The former began treatment of cogongrass and torpedo grass this fiscal year. In addition, the USACE has received guidance to incorporate invasive species control into the PIRs for CERP projects.

Local governments also eradicate invasive exotic plants on environmentally sensitive lands. In Miami-Dade County, approximately $3 million per year is invested in management of wetland, pine rockland, and hardwood hammock plant communities.

Subgoal 2-B: Control Invasive Exotic Plants and Animals
Comprehensive Accomplishments July 2010–June 2012

Objective	Projects	Status
Maintenance Control of Invasive Exotic Plant Objective 2-B.1: Achieve maintenance control of Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern on south Florida's public conservation lands by 2020.	Invasive Exotic Plants Control in Terrestrial and Aquatic Natural Systems [Project ID 2502]	**Implementation:** Maintenance control of melaleuca achieved in most regions of the Everglades Protection Area.
	Invasive Species Research and Information Exchange [Project ID 2503]	**Implementation:** Ongoing.
	Develop and implement a FWS Florida Invasive Species Strike Team [Project ID 2504]	**Implementation:** Ongoing.
	C&SF:CERP - Melaleuca Eradication and Other Exotic Plants [Project ID 2505]	**Construction:** Rearing facility under construction. Completion expected October 2012.
	Everglades National Park Exotic Control Program [Project ID 2506]	**Implementation:** Ongoing.
	Hole-in-the-Donut [Project ID 2507]	**Implementation:** Ongoing.
	Aquatic and Upland Invasive Plant Management [Project ID 2508]	**Implementation:** Ongoing.
	Exotic Species Removal [Project ID 2509]	**Implementation:** Ongoing.
Biological Control of Invasive Exotic Plants Objective 2-B.2: Release two biological control insects per year for the control of invasive exotic plants.	Melaleuca Biological Control Agents [Project ID 2602]	**Implementation:** Ongoing.
Control of Invasive Exotic Animals Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2014	Eradication of Gambian Pouch Rat [Project ID 2700]	**Implementation:** Ongoing.

Goal 3: Foster Compatibility of the Built & Natural Systems

Photo by Everglades National Park

Balmy weather, vibrant communities, beautiful scenery, and abundant natural habitats at the land/sea interface offer south Florida residents a unique choice of lifestyles and visitors a variety of destinations. The diversity of landscapes, including some of the most intensively developed and densely populated areas in the state, has contributed to the economic success and high quality of life enjoyed by Floridians and experienced by visitors from around the world.

This lifestyle has not come without a price. Tremendous population growth, accompanying urban sprawl, and the subsequent need for related infrastructure and public services have resulted in adverse impacts on natural ecological systems. Development patterns have resulted in the loss of natural habitats and connectivity. The region's intensive growth and development have also heightened concerns regarding flood protection and water supply.

The strategy for restoration, project highlights, and a table detailing progress toward the measurable objectives for Goal 3 are on pages 24-34.

Goal 3: Foster Compatibility of the Built & Natural Systems

Subgoal 3-A: Use & Manage Land in a Manner Compatible with Ecosystem Restoration

Objective 3-A.1: Designate or acquire an additional 10,000 acres of lands needed for parks, recreation, and open space to complement South Florida Ecosystem restoration through local, state, and federal programs by 2015.

Objective 3-A.2: Increase participation by 350,000 acres in the Grassland Reserve Program, Wetland Reserve Program, Farm and Ranch Land Protection Program, and the Environmental Quality Incentive Program to promote compatibility between agricultural production and South Florida Ecosystem restoration by 2014.

Objective 3-A.3: Increase the use of educational programs and initiatives to further public and local government understanding of the benefits of South Florida Ecosystem restoration.

Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration

Objective 3-B.1: Objective 3-B.1: Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments.

Objective 3-B.2: Objective 3-B.2: Rehabilitate the Herbert Hoover Dike to provide adequate levels of flood protection to the communities and lands surrounding Lake Okeechobee.

Subgoal 3-C: Provide Sufficient Water Resources for the Built & Natural Systems

Objective 3-C.1: Plan for regional water supply needs.

Objective 3-C.2: Increase volumes of reuse on a regional basis.

Objective 3-C.3: Increase water made available through the state's Water Protection and Sustainability Program and the SFWMD Alternative Water Supply Development Program.

Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration

To maintain a high quality of life for south Florida's residents, the built environment must be planned and managed in a manner that both supports the social and economic needs of communities and is compatible with the restoration, preservation, and protection of natural habitats and species. This requires development patterns, policies, and practices that serve both the built and natural systems.

Strategy & Restoration Progress

The strategy for Subgoal 3-A consists of three measurable objectives that focus on the compatibility of land use with restoration efforts. Progress during the reporting period (July 2010–June 2012) is described below and further delineated in the table on pages 26. Additional efforts that will help fulfill this subgoal are also described below.

Parks, Recreation, and Open Space

Strategy. Park, recreation, and other open space lands will protect natural systems and/or serve as buffers between natural and built environments. Greenways, blueways, and trails will multiply the benefits of open spaces by linking them and enhancing public access.

Progress. During this reporting period, the SFWMD completed several public use projects that have contributed to this goal. A six-mile bike trail was developed on the Grassy Island property and a picnic shelter was installed at Starvation Slough located in Okeechobee County. In Collier County, the Bird Rookery trail head and parking area was completed, providing hiking access to miles of tram roads and a boardwalk located within the CREW wildlife and Environmental Area. In Miami-Dade County, the Rocky Glades Public Small Game Hunting Area was opened to the public providing recreational opportunities in the form of hiking, biking, and hunting on areas adjacent to the L-31 levee.

In Martin County, several trail-related projects were completed in cooperation with Martin County and the FWC. At the John C. and Mariana Jones/ Hungryland Wildlife and Environmental Area, two parking trail heads were constructed to improve access for hiking, biking, hunting, and equestrian use. In addition, approximately 2.5 miles of roadway were improved to provide all-season vehicle access to interior portions of the Allapattah Flats Wildlife Management Area and a new picnic shelter was constructed on the DuPuis Wildlife and Environmental Area. In Orange County, a shelter was constructed at the Shingle Creek Management Area and on the Kissimmee Chain of Lakes, several public use projects were completed including two airboat crossings which provide access across interior roads and the installation of two picnic shelters on Lake Kissimmee, one located in Osceola County and one in Polk County.

Two public boat ramps and associated day-use areas were also constructed and opened during this period. On Lake Kissimmee, the Coleman Landing at Shady Oaks Recreation Area in Polk County was completed and opened to the public. On the Kissimmee River in Highlands County, the Istokpoga Canal Boat Ramp Area was completed and opened for public use. Both ramps include multi-lane power boat ramps, floating docks, and separate dry launch airboat ramps. Also, the Corps completed improvements to their three Visitor Centers along the Okeechobee Waterway to better educate the public on programs including water management, lock operation, invasive species, and recreational opportunities.

To assist in the management of SFWMD campgrounds, three campground host sites, complete with concrete pad, water, sewer, and electrical hook-ups for RVs were constructed on the DuPuis Wildlife and Environmental Area in Martin County and at the Hickory Hammock Equestrian Center and Istokpoga Canal Boat Ramp Area located in Highlands County. The development of these sites and utilization of volunteers to provide a presence on high use areas, such as campgrounds, have proven to be a cost-effective means for effectively managing recreational activities on SFWMD lands.

County conservation land acquisition programs also play an important role in conserving the south Florida landscape. Local governments acquire lands that ultimately contribute to all three goals of the Task Force.

Compatible Agriculture

Strategy. Agriculture is Florida's second leading industry and a large portion of agricultural land can be viewed as open space that benefits the natural system through buffering, revitalization of natural habitats, water

storage and filtration, and aquifer recharge. In addition to regulatory programs and BMPs, several voluntary conservation programs are successfully assisting landowners in protecting and preserving natural resources on agricultural lands. These successes not only aid Everglades restoration but are instrumental in improving estuaries and lessening the impact of non-point source pollution on coral reefs, a total package for ecosystem restoration.

Progress. The 2008 Farm Bill responded to a broad range of emerging natural resource challenges faced by farmers and ranchers, including soil erosion, wetlands, wildlife habitat, and farmland protection. Private landowners will benefit from a portfolio of voluntary assistance, including cost-share, land rental, incentive payments, and technical assistance. The 2008 Farm Bill places a strong emphasis on the conservation of working lands, ensuring that land remains both healthy and productive. The assistance includes the design, layout, and consultation services associated with the conservation practice application or management guidance provided. Technical assistance is targeted towards nutrient management, water quality, and water conservation concerns associated with animal feeding, livestock grazing operations, and fruit and crop production within the Everglades ecosystem. During 2010–2012, a total of 300,161 acres in the 16-county south Florida region were enrolled in Farm Bill conservation programs at an obligated cost of $290,969,787.

Other efforts

Partnerships for Integrating the Built and Natural Systems:
The NOAA Center for Sponsored Coastal Ocean Research (CSCOR) is funding a University of Miami Rosenstiel School of Marine and Atmospheric Science (RSMAS) project called the Marine and Estuarine Goal Setting for South Florida (MARES). This 3 year project is in its last year. It is a collaboration between academic scientists, federal and state agency experts and non-governmental environmental organizations working in close conjunction with agency managers, private industry stakeholders and interested members of the public. The goal of MARES is to reach a science-based consensus about the defining characteristics and fundamental regulating processes of the south Florida coastal marine ecosystem that is both sustainable and capable of providing the diverse ecological services upon which our society depends.

The first step in the process involves the development of Integrated Conceptual Ecosystem Models (ICEMs) for three sub-regions (Florida Keys and Dry Tortugas, Southeast Florida Shelf and Southwest Florida Shelf) and a Total Marine System ICEM integrating these with available Conceptual Ecological Models (CEMs) for Biscayne Bay, Florida Bay and the Caloosahatchee Estuary. The MARES models incorporate not only natural science information and processes but also human dimensions science and societal processes. These models and a series of public meetings, agency briefings, and workshops were used to identify Quantitative Ecosystem Indicators (QEIs). These QEIs are being integrated into a South Florida coastal ecosystem report card which will assist natural resource and environmental management of south Florida by providing a common reference to the management actions taken by the participating federal and state agencies.

Community Understanding

Strategy. Public outreach and communication form an important cornerstone for support of ecosystem restoration efforts. Public outreach strategies aim to instill a broad sense of stewardship, and responsibility for all stakeholders involved, including private citizens. Efforts include environmental education, small business outreach, community outreach, and project-specific local outreach.

Progress. The USACE and the SFWMD continued their efforts to raise awareness about the CERP and overall restoration of the South Florida Ecosystem. Many projects have been transitioning from planning to construction groundbreakings and other milestone ceremonies.

An expanded web presence and greater electronic communication, including monthly e-notices and social media interaction, have combined with traditional outreach methods to help ensure that the CERP and the greater Everglades ecosystem is better understood and that the public has opportunities to participate in decision-making.

Subgoal 3-A:Use and Manage Land in a Manner Compatible with Ecosystem Restoration

Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration Comprehensive Accomplishments July 2010—June 2012		
Objective	**Projects**	**Status**
Parks, Recreation, and Open Space Objective 3-A.1: Designate or acquire an additional 10,000 acres of lands needed for parks, recreation, and open space to complement South Florida Ecosystem restoration through local, state, and federal programs by 2015.	Florida Communities Trust Grant Program	**Land Acquisition:** A total of $567.5 million has been spent on acquiring all 26,300 acres of the State's Florida Communities Trust Lands.
	Florida Keys Overseas Heritage Trail [Project ID 3200]	**Planning:** Completed for three new segments; underway for six others. **Construction:** Completed for 4.7 miles; underway for 14 miles.
	Lake Okeechobee Scenic Trail [Project ID 3201]	**Planning:** Underway for Taylor Creek pedestrian bridge. **Construction:** Completed for 62 miles of paved levee-top trail and 2.5 miles of at-grade trail in Fisheating Creek.
	Florida Greenways and Trails Program [Project ID 3202]	**Planning:** 2 Blueway systems (Lee County and Charlotte County), Shingle Creek paddling trail, and Shingle Creek Regional Park designated. **Land Acquisition:** 5.22 acres in Orange County.
Compatible Agriculture Objective 3-A.2: Increase participation by 350,000 acres in the Grassland Reserve Program, Wetland Reserve Program, Farm and Ranch Land Protection Program, and the Environmental Quality Incentive Program to promote compatibility between agricultural production and South Florida Ecosystem restoration by 2014.	Technical Assistance to Indian Reservations [Project ID 3300]	**Implementation:** Ongoing.
	2002 Farm Bill Conservation Programs [Project ID 3301]	**Implementation**: Enrolled 230,621 acres at an obligated cost of $217,906,512.
Community Understanding Objective 3-A.3: Increase the use of educational programs and initiatives to further public and local government understanding of the benefits of South Florida Ecosystem restoration.	USACE CERP Public Outreach and Assistance [Project ID 3502]	**Implementation:** Ongoing; detailed information is available on the project sheet in the Integrated Financial Plan.
	SFWMD Outreach Program [Project ID 3503]	**Implementation:** Ongoing; detailed information is available on the project sheet in the Integrated Financial Plan.

Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration

Photo by Carlton Ward, Jr.

Additional Efforts

The Wetlands Reserve Program (WRP). The WRP is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA Natural Resources Conservation Service (NRCS) provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.

Fisheating Creek Wetland Program. The NRCS will administer the WRP including the Fisheating Creek Wetland Reserve Special Project while the SFWMD will provide assistance by providing hydrologic restoration planning and modeling assistance, restoration project permitting, and incorporation of water quality performance monitoring into existing monitoring networks. Fisheating Creek Wetland restoration will reduce the amount of surface storm water leaving the land, slowing water runoff and the concentration of nutrients entering Lake Okeechobee and the Everglades. Under the WRP these landowners sold the development rights to their land and placed it in a permanent conservation easement. The easements will contribute to the connection of public and private lands and help form a conservation corridor from the Kissimmee River to the ENP. Easements on existing conservation lands provide the large open spaces, food resources, and connectivity needed to sustain wide ranging animals like the federally endangered Florida panther. Other species found on these lands include the crested caracara, Florida black bear, red-cockaded woodpecker, and the whooping crane.

Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration

Northern Everglades and Estuaries Protection Program. Throughout the 20th Century, agricultural producers in what is now referred to as the Northern Everglades were encouraged to construct surface water drainage systems to facilitate the establishment and production of "improved" pasture forages and crops. As a result, thousands of miles of surface water drainage systems and other water control infrastructures were installed, resulting in accelerated drainage of both water and nutrients from local ranches and farms into downstream water bodies. The SFWMD is partnering with the USDA-NRCS to deliver the WRP to agricultural landowners located within the NEEPP region. This program consists of a comprehensive wetland restoration and conservation easement effort designed to restore and protect wetlands that will improve water quality and provide habitat for rare, endangered and threatened animals, birds, and plants in the Northern Everglades. As a result of this program, the amount of surface waters leaving lands from participating landowners will be reduced due to infiltration and evapotranspiration and will occur over a more natural period of time compared to drained pastures, and thus, concentrations of nutrients entering the public water management system and ultimately Lake Okeechobee will be reduced.

The American Prime. This acquisition required a sequence of events involving multiple agencies and was accomplished just in time to prevent the land from going to foreclosure auction. Protecting this land was made possible through the cooperative efforts of several partners including TNC, the USFWS, the USDA-NRCS, the National Fish and Wildlife Foundation (NFWF), Walmart, the Corps, and others. A portion of the protected land will continue in the rich ranching heritage of south Florida and another portion will have its wetlands restored to enhance wildlife habitat. The purchase was covered by approximately $2 million from TNC in private philanthropy, and $1.5 million each from the USFWS and the private entity that purchased the property encumbered by conservation easements. The NRCS provided $1.5 million to purchase a conservation easement on 718 acres of the property. Another $200,000 was provided through Acres for America, a partnership between the NFWF and Walmart.

Photo by Brent Anderson

Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration

Land suitable for development and human habitation will continue to require considerable flood protection, since without such protection most of south Florida would be unsuitable for existing urban and agricultural uses. Given the population growth projections for south Florida, there will be an ongoing need for monitoring and balancing the flood protection needs of urban, natural, and agricultural lands as part of restoration.

WRDA 2000 clearly states that implementation of the CERP shall not reduce levels of service for flood protection that were in existence on the date that the law was enacted and in accordance with applicable law. The Savings Clause states that CERP projects, including increased canal and groundwater levels, need to be accomplished in a way that does not harm flood protection.

Strategy & Restoration Progress

The strategy for Subgoal 3-B consists of two measurable objectives and additional efforts that focus on flood protection. Progress on the two measurable objectives during the reporting period (July 2010–June 2012) is delineated in the table on page 22.

Public Works Construction

Strategy. Capital improvements, modifications, and repairs to water control and conveyance facilities will help maintain and improve flood protection. The CERP consists of numerous projects that may provide incidental improvements to flood protection while decreasing the loss of freshwater supplies. Other projects, including some partially funded by the Federal Emergency Management Agency (FEMA), also seek to improve or maintain flood protection in the region.

Progress. The C-4 Flood Mitigation Projects include multiple individual projects to provide flood mitigation in the C-4 Basin. These include impoundments, pump stations, flood walls, and berms as well as conveyance improvements. Eight projects have been constructed with three currently under design.

Herbert Hoover Dike Rehabilitation

Strategy. The Herbert Hoover Dike (HHD) system consists of approximately 143 miles of embankment surrounding Lake Okeechobee. Rehabilitation will address seepage, embankment stability and problematic foundation conditions, and will provide adequate levels of flood protection to adjacent communities.

Progress. The Major Rehabilitation Report (MRR) from 2000 divided the 143-mile embankment into eight reaches with the initial focus on Reach 1. This Reach by Reach rehabilitation approach has been replaced with a system-wide risk reduction approach as required for safety modifications to Corps dams. The supplemental MRR being produced for Reaches 2 and 3 will become a system wide Dam Safety Modification (DSM) Report. (The MRR approach and approval for Reach 1 occurred prior to procedural changes implemented post-Katrina.) The DSM report will address the entire dike as a system and will include a risk reduction approach to implementing features based on priority and reducing risk as quickly as possible. All features planned and under construction support the goal of this report. Construction of the cutoff wall continues in Reach 1 with completion of the planned 21.4 miles by 2013.

In 2011, the Corps approved a plan to replace, abandon or remove the 32 water control structures (culverts) operated by the Corps within the HHD system. This project is being implemented as part of the risk reduction approach to the entire system. The Corps has completed removal of one culvert while four culvert replacements are underway. Planning and design for replacement of the next seven culverts and the abandonment of three culverts is underway.

As part of the DSM report effort, a seepage management pilot test is planned for construction in 2012 to demonstrate the constructability of an alternate risk reduction feature to address the embankment and foundation piping issues. The results of this demonstration will be utilized in the DSM for future consideration.

Additional Efforts

Non-structural Flood Protection. Numerous non-structural options for flood protection exist for the built environment. These include ensuring that new construction meets FEMA guidelines, land use planning to guide development away from flood-prone areas, and acquiring undeveloped lands from willing sellers.

Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration

Photo by U.S. Army Corps of Engineers

Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration Comprehensive Accomplishments July 2010–June 2012		
Objective	**Projects**	**Status**
Public Works Construction Objective 3-B.1: Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments.	C-4 Flood Mitigation Projects [Project ID 3600]	**Planning:** Completed **Construction:** Eight projects completed; three projects under design
Herbert Hoover Dike Rehabilitation Objective 3-B.2: Rehabilitate the Herbert Hoover Dike to provide adequate levels of flood protection to the communities and lands surrounding Lake Okeechobee.	Herbert Hoover Dike Rehabilitation [Project ID 3700]	**Planning:** Planning and design underway for replacement of Culverts 3, 4A, 5, 5A, 10, 12, 13. Planning underway for abandonment of Culverts 7, 9 and the Taylor Creek Culvert. Design of the Seepage Management Pilot Test completed. **Construction:** Over 90% completed for Reach 1 cutoff wall. Removal of Culvert 14 completed. Replacement of Culverts 1, 1A, 11 and 16 underway. DSM to be completed in 2014.

Photo by Brent Anderson

Subgoal 3-C: Provide Sufficient Water Resources for the Built and Natural Systems

The State of Florida independently and both the federal and state partners under the CERP have specific responsibilities regarding existing and future water supply for both the built and natural systems. The State of Florida has statutory goals and responsibilities to ensure an adequate supply of water for protection of the natural system along with existing and future "reasonable-beneficial" potable, industrial, and agricultural uses. The CERP authorization in the WRDA 2000 specifically provides that the CERP serves as a framework for restoring, preserving, and protecting the South Florida Ecosystem while providing for other water related needs of the region, including water supply.

Strategy & Restoration Progress

The strategy for Subgoal 3-C consists of three measurable objectives and additional efforts that focus on water supply. Progress on the three measurable objectives during the reporting period (July 2010–June 2012) is delineated in the table on page 32.

Water Supply Plans

Strategy. Regional water supply plans for each of the four SFWMD planning areas will be updated every five years to reassess water resource conditions and water resource and water supply projects. The goal of each plan is to meet the water supply needs of the region during a one-in-ten year drought and the needs of the environment while not causing harm to the water resources.

Progress. The Upper East Coast Update was completed in 2011. The process to update the plans for the Lower West Coast (LWC), Lower East Coast (LEC), and Kissimmee Basin (KB) is underway. The LWC Update is scheduled for completion in the fall of 2012 while the LEC Update is scheduled for completion in early 2013. The KB Update is divided into two efforts. The Upper Portion of the KB is in the Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP) area, which is a joint effort between the South Florida, Southwest Florida, and St. Johns River Water Management Districts. The CFWI RWSP is scheduled for completion in early to mid-2013. Parallel to this effort, the update for the Lower KB is being initiated in partnership between the USACE and the SFWMD and is scheduled for completion in early 2013. The planning horizon for these updates is 2030. The plan updates include development of goals and objectives, population and demands projections, issue identification, water source options, water supply and water resource projects, and future direction. The plans are completed in a public process under the auspices of the SFWMD's Water Resources Advisory Commission (WRAC).

Water Conservation and Reuse

Strategy. The SFWMD regional water supply plans outline the planning and permitting efforts that will encourage water conservation and lower consumptive use rates over time. Reuse projects will treat and discharge wastewater for a variety of uses, including ground water recharge, environmental enhancement, and irrigation. The CERP contemplates the use of reclaimed water to help meet the freshwater requirements of the southern end of the Everglades system, including Biscayne Bay.

Progress.
Conservation: The SFWMD continues to implement its 2008 Comprehensive Water Conservation program and development of a year-round conservation ethic. Utility per capita water use utilized in water supply plans continues to trend downward.

Reuse: Due to uncertainties concerning ecological effects of application of reclaimed water to sensitive water bodies, such as tidal waters and coastal wetlands of the BNP, several assessments and demonstration scale projects have been conducted. The Miami-Dade Water and Sewer Department conducted a pilot project from November 2010 to April 2011 to assess the use of highly treated reclaimed water for recharge of the Biscayne aquifer upstream of the water supply wellfield. The county also conducted pilot testing of technologies for water quality objectives related to rehydration of coastal wetlands. Miami-Dade County submitted a final report to the SFWMD, FDEP, and BNP in October 2011. The report included information on effectiveness and costs of best available technologies in achieving treatment objectives. Design and implementation of a full scale project has been deleted from Miami-Dade's long-term water facilities plan as a result of reduced water demands cost-effectiveness and the economic downturn are being pursued to offset future consumptive uses. These efforts could be used to evaluate the role of large scale reuse in augmenting system-wide water budgets, either by providing additional water or by offsetting existing consumptive uses.

Subgoal 3-C:Provide Sufficient Water Resources for the Built and Natural Systems

In 2008, the Florida Legislature passed a law requiring wastewater effluent discharges through ocean outfalls to cease by December 31, 2025, except as “backup discharge” to a functioning reuse system. In addition, the law requires that those utilities implement 60 percent reuse of the effluent being discharged to the ocean or about 18 million of gallons per day (mgd) by the 2025 deadline. Utilities are required to submit their implementation plan to the FDEP by July 1, 2013.

Subgoal 3-C: Provide Sufficient Water Resources for the Built and Natural Systems Comprehensive Accomplishments July 2010–June 2012

Objective	Projects	Status
Water Supply Plans Objective 3-C.1: Plan for regional water supply needs.	Regional Water Supply Plans [Project ID 3800]	**Reports:** UEC was completed in 2011. LWC underway for approval in 2012; LEC and KB planned for approval in 2013.
Water Conservation and Reuse Objective 3-C.2: Increase volumes of reuse on a regional basis.	C&SF: CERP South Miami-Dade County Reuse [Project ID 3900]	**Planning:** Local governments have conducted advanced treatment pilot studies to assess feasibility of using reclaimed water for restoration. . As a result of reduced water demands, cost effectiveness and the economic downturn, no additional work related to use of reclaimed water for wetland restoration is underway. Alternative reuse strategies involving the Floridan aquifer appear more cost effective
Alternative Water Supply Development Objective 3-C.3: Increase water made available through the state’s Water Protection and Sustainability Program and the SFWMD Alternative Water Supply Development Program.	Alternative Water Supply Grant Program [Project ID 4000]	**Implementation:** 31 projects funded in FY2011 & 2012

Photo by Scott Prinos

Subgoal 3-C: Provide Sufficient Water Resources for the Built and Natural Systems

Photo by Bill Perrry

Alternative Water Supply Development

Strategy. Alternative technologies for water supply development are more expensive than historically used freshwater water sources. The Alternative Water Supply Development Program in coordination with the state's Water Protection and Sustainability Program provides grants and cost-sharing for alternative water supply development such as saltwater, brackish water, and aquifer storage and recovery reclaimed water projects.

Progress. Currently, over 235 mgd of reclaimed water is being reused for beneficial purposes in the SFWMD. In addition, there are 35 desalination facilities with a total capacity of 245 mgd (all but two utilize brackish ground water as source water). The Alternative Water Supply (AWS) Program recommended that 31 projects receive funding for Fiscal Year (FY) 2011 and 2012 with a total of $8.77 million. No state funding was available in these years.

Additional Efforts

Water Reservations and Allocations. WRDA 2000 requires that the State of Florida reserve or allocate water for the natural systems associated with implementation of the CERP. Water necessary to achieve the natural system benefits of each CERP project will be identified within each PIR. Water reservations have been adopted in association with the Picayune Strand Restoration Project and the Indian River Lagoon-South Project. Water reservations are currently being developed for the Caloosahatchee River (C-43) West Basin Storage Reservoir project and the Biscayne Bay Coastal Wetlands Phase I project. Water allocation rules have been adopted that protect natural system water for the Site I impoundment project.

Subgoal 3-C: Provide Sufficient Water Resources for the Built and Natural Systems

2008 Comprehensive Water Conservation Program. In September 2008, the SFWMD Governing Board approved the Comprehensive Water Conservation Program, the compilation of a 2-year collaborative process with over 20 stakeholders representing 14 interest groups. The program is organized into three initiatives: regulatory, voluntary and incentive-based, and education and marketing. The overall program is built on a set of core values identified by the SFWMD's stakeholder group and is designed to be sustainable, science-based, measurable, goal-based, environmentally protective, equitable wherever possible, and practicable. The SFWMD is currently implementing the program recommendations in an effort to achieve efficient levels of water use and ensure, in conjunction with other initiatives, an adequate and reliable supply of water to both protect the health of the ecosystem and satisfy current and future water demands.

Minimum Flows and Levels. Florida law directs the SFWMD to set minimum flows and levels (MFLs) to prevent significant harm to water resources. The SFWMD will continue to establish MFLs for the ecosystem's priority water bodies. The MFL Priority Water Body List and Schedule is prepared annually. Once adopted, MFLs are implemented through the SFWMD's consumptive use permitting and water supply planning program.

Photo by Jose Cabaleiro

System-wide Ecological Indicators

The Task Force has established a suite of system-wide ecological indicators to assess current ecosystem health and provide a means to track ecosystem response to restoration. This suite of system-wide ecological indicators and the green-yellow-red "stoplight" graphics were developed specifically as a communication tool to provide a big picture view of the ecosystem's health and response to restoration in a non-technical format. The system-wide ecological indicators and stoplight illustrations provided herein represent just a summary of broader and more detailed science assessments available in companion reports.

How the System-wide Ecological Indicators Relate to other Indicators

The system-wide ecological indicators are attributes that are expected to be responsive to restoration actions and represent more numerous and broader biological components and processes in the ecosystem. All of the indicators except invasive exotic plant species are included within the context of the Comprehensive Everglades Restoration Plan (CERP) Restoration Coordination and Verification (RECOVER) Monitoring and Assessment Plan (MAP 2009). The MAP monitors many additional aspects of the ecosystem, including: hydrology, water quality, and other ecological attributes. In addition, CERP individual project monitoring plans specify monitoring of additional ecological indicators and attributes of the ecosystem to support adaptive management of CERP project implementation and meet various regulatory requirements. Some of these additional ecosystem attributes include threatened and endangered species, mercury, water levels, water flows, dissolved oxygen, soil accretion and loss, phosphorus concentrations in soil and water, hydrologic sheet flow, percent of landscape inundated, vegetation changes, ridge and slough and tree island landscape patterns, and salinity. These monitoring and assessment activities occur throughout the South Florida Ecosystem and are supported by various agencies for multiple purposes.

The system-wide ecological indicators are a subset of the broader CERP RECOVER monitoring and assessment program and are intended to provide a system-wide, big-picture appraisal of restoration in an easily understood format (stoplights), rather than presenting a more detailed, technical assessment of data and lessons learned as in the RECOVER System Status Reports (SSR) or the South Florida Environmental Report (SFER) .

Where the same indicators and data are being assessed, the information can be integrated. This combination of indicator reports provides managers with information they can use to identify where restoration activities may need to be adjusted and what adjustments need to be made once projects are completed and operating. The 2012 SSR Interim Update, along with additional information on the RECOVER MAP program, is available at: www.evergladesplan.org/pm/ssr_2012/ssr_main_2012.aspx.

The system-wide ecological indicators will help evaluate current ecological conditions and responses resulting from implementation of multiple restoration projects in south Florida. Indicator response will also help determine appropriate system operational refinements that may be necessary for multiple habitat types within the South Florida Ecosystem.

Funding reductions can decrease monitoring and impact our ability to assess the status of the Everglades ecosystem and restoration efficacy. Initial losses of information from reduction in RECOVER MAP funding in fiscal year 2012 affected some of the indicators in this biennial report. Reduction in monitoring changes how the indicators can be reported and may reduce our ability to understand system dynamics, something that the National Research Council (NRC) (2008) recognized as a strength in the monitoring program and critical for implementing an adaptive management approach.

The recent NRC 2012 report reiterated the importance of system-wide monitoring to ensure the success of Everglades restoration and cautioned that five years of data such as that used in the 2009 SSR (2004-2008) provides a relatively short time frame on which to base decisions. It is important to have monitoring data that covers a long enough time period to show pre-project, during construction, and post-project responses in the context of natural ecosystem variability so that human caused responses can be distinguished from natural variation.

The NRC (2012) emphasized the need for the RECOVER MAP to provide support for CERP planning, adaptive management, and public communication in a cost-effective manner. Given this need and 2012 MAP reductions and projected funding challenges, a comprehensive review of the MAP and other complementary monitoring programs that were considered in the original MAP design now is needed.

The Selection Process

The approach used to select the system-wide ecological indicators focused on individual indicators that integrate numerous physical, biological, and ecological properties, scales, processes, and interactions to try to capture the big picture using a relatively small set of indicators. The goal was to select a suite of indicators that comprehensively cover the range of ecosystem response to restoration actions, whether the response is rapid or gradual, localized or widespread. The indicators were also selected due to the availability of sufficient and suitable information to accurately assess ecological conditions.

Individual indicators were peer reviewed and the suite of system-wide ecological indicators was independently reviewed by an expert panel. Jordan et al. 2006 http://www.sfrestore.org/scg/documents/index.html)

Details of the process for developing each indicator are published in a special issue of the scientific journal Ecological Indicators (Vol 9, Supplement 6, November 2009).

System-wide Ecological Indicators

Invasive Exotic Plants
Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation
Eastern Oysters
Crocodilians (American Alligators & Crocodiles)
Fish and Macroinvertebrates
Periphyton and Epiphyton
Wading Birds (White Ibis and Wood Stork)
Southern Estuaries Algal Blooms
Florida Bay Submersed Aquatic Vegetation
Juvenile Pink Shrimp
Wading Birds (Roseate Spoonbill)

Agency funding decisions impact the ability to monitor and report on these indicators. Given reductions in funding for monitoring the Task Force will likely have to revisit its approach to reporting on restoration progress in future biennial reports.

Changes From the 2010 Report

A number of changes have been made to the 2012 report to improve the document. We provide more consistency in reporting across indicators by being more consistent in location names and having a commonly defined reporting period (the South Florida Water Management District (SFWMD) Water Year; May 1 – April 30). This also will help provide consistency with other reports such as the SFWMD SFER.

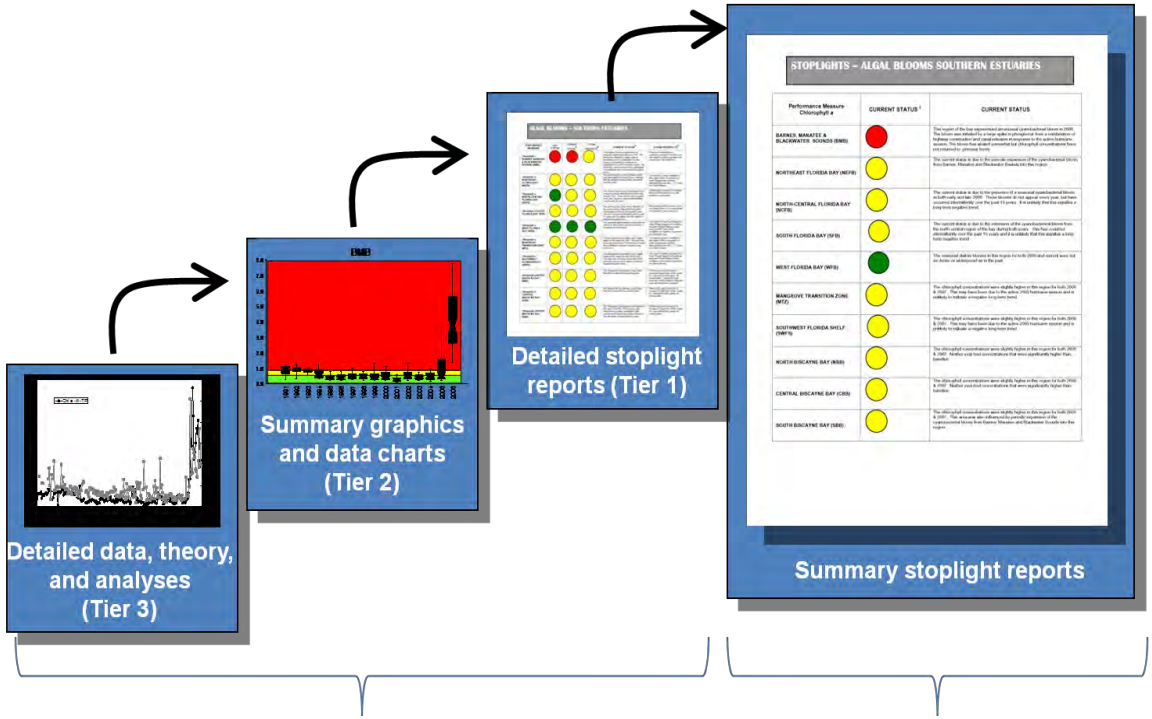
We have added a section on hydrologic context. Although not presented as a "stoplight" indicator themselves, general hydrologic measures, such as rainfall patterns and water depths, provide a frame of reference so that responses of the indicators can be evaluated in relation to hydrologic characteristics of that water year or area.

We have added an "Indicators at a Glance" section that provides a snapshot of each indicator by geographic region for the last five years. Within each individual indicator section, we added a trend arrow that reflects best professional judgment on the direction that indicator will go in the next two years taking into account what we know about past performance of the indicator, projected CERP project implementation and assuming no major natural or human caused disturbances.

Further Details

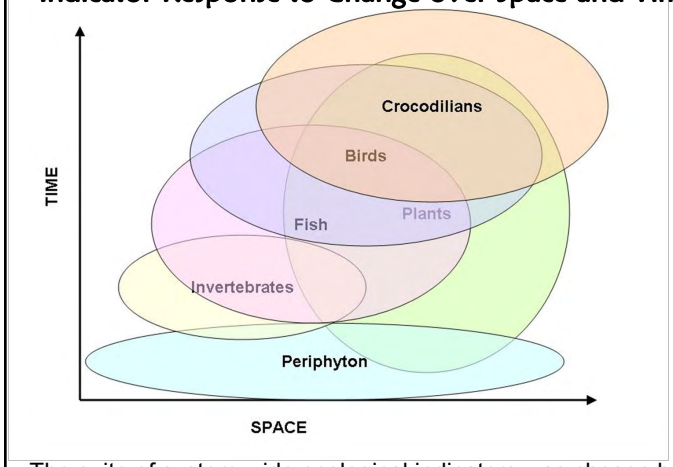
More detailed information on these indicators can be found in the *System-wide Ecological Indicators for Everglades Restoration: 2012 Report* available on the Task Force website.

Development of Summary Stoplight Reports



The indicator summaries contained in this document were synthesized from scientific information compiled within the *System-wide Ecological Indicators for Everglades Restoration: 2012 Report*. The assessment report contains detailed data and analyses on each indicator. That information was rolled up into detailed stoplight reports that relate cumulative data on the indicators and provide a framework for seeing trends in restoration for each indicator. These detailed stoplight reports were synthesized into summary stoplight reports for this document to illustrate key findings and the current status of the indicators, and to reflect any changes in indicator status from the last Biennial Report (2010).

Indicator Response to Change over Space and Time



The suite of system-wide ecological indicators was chosen based upon their collective ability to comprehensively reflect ecosystem response in terms of space and time. For example, periphyton responds to change very rapidly at both small and large spatial scales while crocodilians respond more slowly to change and at larger spatial scales. As indicators, they "cover" different aspects of the ecosystem. The system-wide ecological indicators collectively "cover" the ecosystem in terms of response to change over space and time.

This figure is an illustration of how individual indicators may interrelate and respond to restoration in terms of space and time. This figure uses six indicators as an example and is not meant to precisely represent the exact spatial and temporal interactions of the system-wide ecological indicators.

Hydrologic Context for the System-wide Ecological Indicators Water Years 2010 – 2011

The following discussion is intended to provide a basic introduction to the south Florida water cycle and a basic description of conditions during the reporting period. A more detailed discussion of this topic is included in the 2012 System-wide Ecological Indicator report. South Florida has essentially two hydrologic seasons, a wet season (May-October) and a dry season (November-April). Within those two seasons rainfall from year to year is variable. This seasonal and inter-annual hydrologic variation play an important role throughout the life cycle of most plants and animals found in the South Florida Ecosystem. South Florida hydrologic conditions are the result of both natural processes (rainfall, evapotranspiration, overland flow, groundwater infiltration, etc.) and water management changes (human manipulations to support flood control, urban and agricultural water supply, and environmental water demands) associated with operations of the Central and Southern Florida (C&SF) project.

South Florida Climate

South Florida is located in the sub-tropics, and the warm climate and associated tropical cyclone activity strongly influences the hydrology and ecology of the region. Although south Florida is generally considered a wet region (with an average annual rainfall of approximately 52 inches) serious droughts are relatively common because of both longer-term climate variations, and the seasonal pattern of rainfall. On average, approximately 77% (or 40 inches) of the total annual rainfall occurs in the May through October wet season, while approximately 23% (or 12 inches) occurs in the November through April dry season. In general, water depths reach relatively highest levels in October, and relatively lowest in May.

Historically, prolonged droughts are broken by periods of increased tropical cyclone activity (tropical depressions, tropical storms, and hurricanes). As an example, Water Year 2010 (May 1, 2009-April 30, 2010) was preceded by a four-year regional drought. The El Niño-Southern Oscillation (ENSO) is a climatic phenomenon caused by warming sea surface temperatures in the eastern Pacific, which produces above-average rainfall and surface water flows during the south Florida dry season. By contrast, La Niña years are associated with cooling Pacific sea surface temperatures, and conversely, droughts prevail. The impacts of seasonal and inter-annual hydrologic variations can be mitigated to some degree by increasing water storage and conveyance capacity, which is a key goal of our Everglades restoration initiatives. The focus of the below maps are the Everglades marshes, more information on Lake Okeechobee will be available in the detailed 2012 System-wide Ecological Indicator report.

Water Year 2010 (May 2009 – April 2010) and El Niño

The water year started out dry, but average wet season rainfall and reduced northern estuary outflows allowed Lake Okeechobee water levels to increase, and by September 2009 the lake had risen by four feet. Water depth patterns in late October 2009 indicate that by the end of the wet season, nearly the entire Everglades were inundated; except for portions of the marl prairies in eastern Everglades National Park (see plate A). The deeper downstream portions of the Water Conservation Areas are artificial impoundments for multiple purposes. A strong El Niño event began in November 2009, increasing dry season rainfall to 175% of normal, and creating persistent surface water conditions throughout the Everglades. The water depth patterns in May 2010 show that persistent surface water was maintained throughout the dry season, except for the higher elevated marl prairies in eastern ENP (see plate B).

Ecological Bottom Line.

Persistent inundation is critical to sustaining organic/peat soils, and the abundance of marsh fish and invertebrates, but extended periods of high water or extreme depths are known to negatively impact certain tree island plant species and some animals. In addition, high water levels in the dry season and recurring rainfall events cause reversals (e.g. a period of increasing water level when it should continue to decrease) in natural water recessions that disturb wading bird foraging, and reduce availability of food for other aquatic animals such as alligators. Hydrological reversals within a year are believed to reduce survival of aquatic animals more than would be expected by a single dry down event of the same total length.

Hydrologic Context for the System-wide Ecological Indicators
Water Years 2010 – 2011

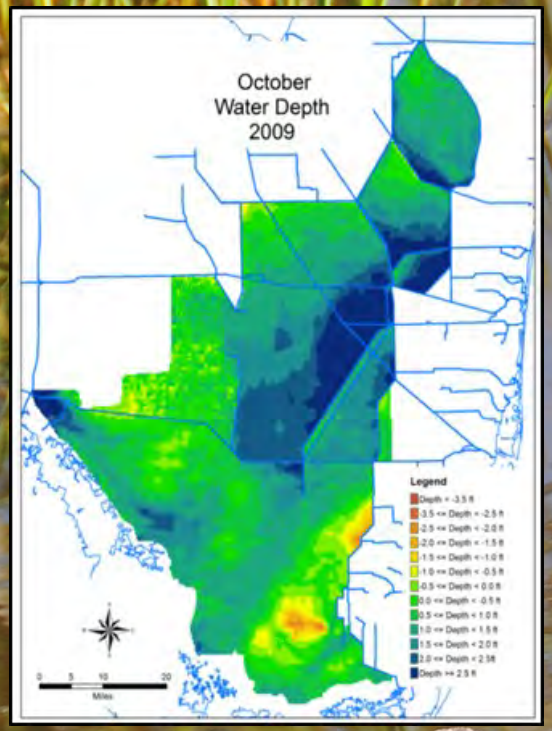
Water Year 2011 (May 2010 – April 2011) and La Niña

The 2011 water year experienced lower than normal wet season rainfall (80% of normal), but water depths in the Everglades remained higher because of the prior dry season rainfall (see plate C). A weak La Niña event began in late spring 2010, and reduced dry season rainfall to 75% of normal. Water depth patterns at the end of the dry season indicate that more than half of the Everglades marshes were dry (water elevation below surface of marsh). The northern portions of the Water Conservation Areas (WCAs) typically go dry as rainfall decreases. More than 80% of the marshes in ENP went dry due to reduced inflows (see plate D).

Ecological Bottom Line.

Dry downs are a natural part of Everglades ecosystem dynamics; however, intense or prolonged dry downs can have significant impacts on fish and aquatic invertebrates, reducing their numbers, and in turn reducing success of the animals that feed on them (alligators and wading birds). These impacts may be observed immediately and for years after such an event. In addition, intense dry downs in the peat forming areas of the Everglades lead to soil subsidence and increased fire threats and increased potential for colonization by invasive exotic plant species.

Water Year 2010
End of Wet Season



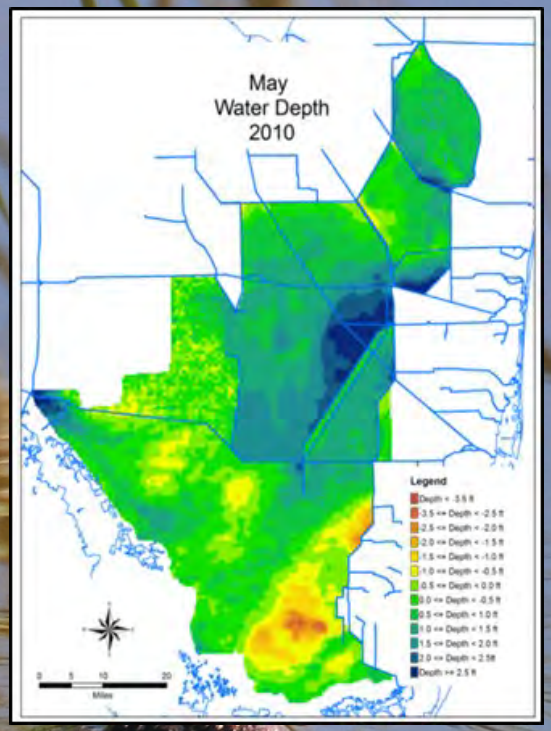
Graphs above show data from October 2009 to May 2011. Weekly average water depths for the end of the dry season (mid May) and the end of the wet season (late October) for water years 2010 and

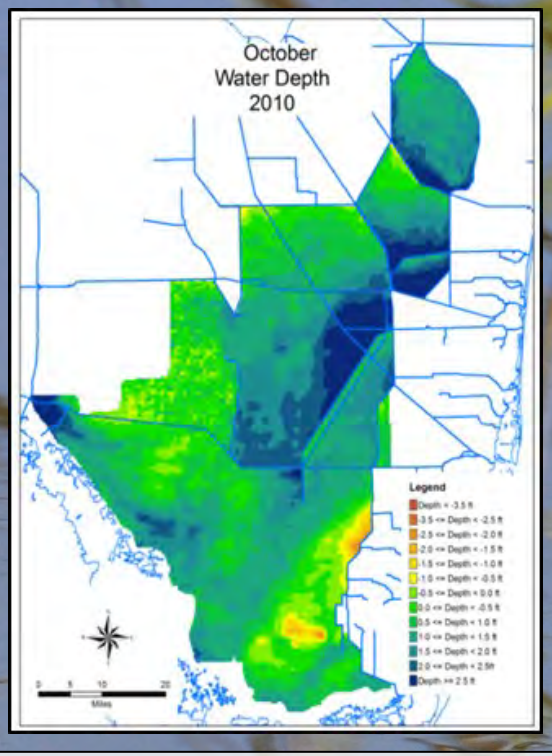
Hydrologic Context for the System-wide Ecological Indicators
Water Years 2010 – 2011

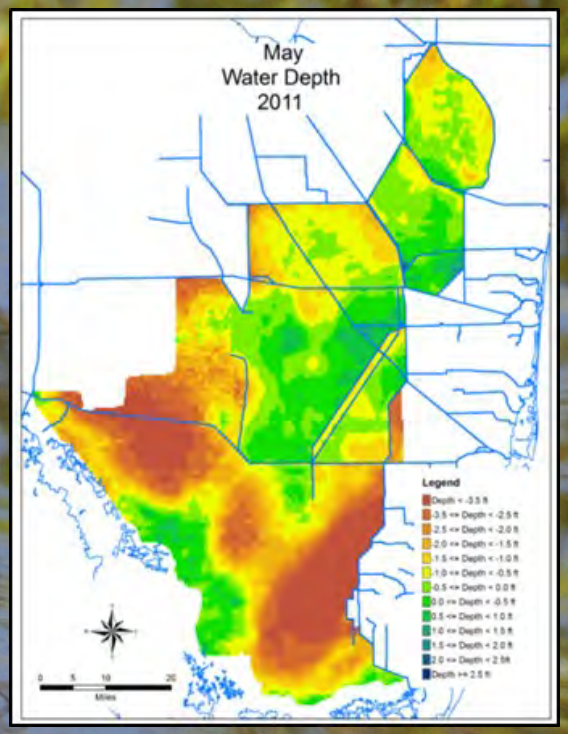
Water Year 2010
End of Dry Season

Water Year 2011
End of Wet Season

Water Year 2011
End of Dry Season







2011. Blues and greens indicate wetter areas, while yellows and oranges indicate drier areas. The persistently flooded areas (dark blue areas) are the result of manmade levees and canals that block marsh sheetflow and create artificial impoundments. The yellow and brown areas (see May 2011) are the result of below normal rainfall and inadequate water flows, highlighting the need for increased upstream water storage. More details on how these years compare to average conditions will be included in the full System-wide indicator report. Source: Everglades Depth Estimation Network, USGS.

Photo by Jose Cabaleiro

System-wide Ecological Indicators

Helpful Hints for Reading the Indicators

Within the system-wide indicator tables, the "Current Status" column contains the most recent indicator information, for most indicators this is the end of the 2012 water year (ending April 30, 2012). The "Last Status" column contains information for water year 2009 (ending April 30, 2009). The trend column provides information that reflects best professional judgment on the direction that indicator will go in the next two years taking into account what we know about past performance of the indicator, projected CERP project implementation and assuming no major natural or human caused disturbances.

The stoplight colors and trend arrows should be interpreted together to get a full understanding of what the indicator is saying about restoration progress and potential directions for restoration priorities. The stoplights show how the indicators have responded while the trend arrow provides insight for assessing what may happen in the future. These communication tools may help highlight where our investments may be most needed or where an adjustment in management strategy is needed. For example an indicator with a yellow stoplight and a downward trend may merit additional or more urgent action than one with a red stoplight and an improving trend.

Stoplight Color Legend

Red	Substantial deviations from restoration targets creating severe negative condition that merits action.
Yellow	Current situation does not meet restoration targets and may require additional restoration action.
Green	Situation is within the range expected for a healthy ecosystem within the natural variability of rainfall. Continuation of management and monitoring effort is essential to maintain and be able to assess "green" status.
Clear	Data have been collected but not processed yet.
Black	No data or inadequate amount of data were collected due to lack of funding.
Trend arrows	Horizontal arrows indicator is stable; up arrow indicator is improving; down arrow indicator is declining.

Indicators at a Glance

This is a snapshot of the status of each indicator by geographic region (listed from north to south) for the last five years. The summary is from the 2012 System-wide Ecological Indicators Report. Results shown here are consistent with an assessment done by the National Research Council (2012), reflecting the continued patterns of severely altered hydrology throughout the ecosystem. An exception is Water Year 2011 in Lake Okeechobee where the Nearshore Zone Submersed Aquatic Vegetation (SAV) exceeded the target level because of successive years where the Lake was near the lower end of the desired stage envelope.

The Summary Format

The Task Force's SCG, in close cooperation with RECOVER and the broader community of indicator scientists, have established a common format for assessing and communicating key findings from the system-wide ecological indicators. The indicator summaries that follow utilize a 2-page format with traffic light symbols (stoplights) to enhance understanding at a glance. The summaries beginning on page 43 are based upon a scientific assessment report that includes the detailed data, theory, and analyses. This approach effectively communicates and links the complex underlying science and data in a way that is universally understood.

System-wide Ecological Indicators

	Water Year 2008	Water Year 2009	Water Year 2010	Water Year 2011	Water Year 2012
Lake Okeechobee					
Invasive Exotic Plants Species					
Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation					
Northern Estuaries					
Invasive Exotic Plant Species					
Eastern Oysters					
Greater Everglades					
Crocodilians					
Fish and Macroinvertebrates (WCA 3 and ENP only)					
Invasive Exotic Plants					
Periphyton and Epiphyton					No species composition data
Wading Birds (White Ibis and Wood Stork)					
Southern Coastal System					
Crocodilians					
Southern Estuaries Algal Blooms**					
Florida Bay Submersed Aquatic Vegetation					
Invasive Exotic Plants					
Juvenile Pink Shrimp*	Data used as base	Data used as base	Data used as base		
Wading Birds (Roseate Spoonbill)					Prey community data not yet processed
Wading Birds (White Ibis and Wood Stork)					

*The status Juvenile Pink Shrimp contains information for data collected for September-October.

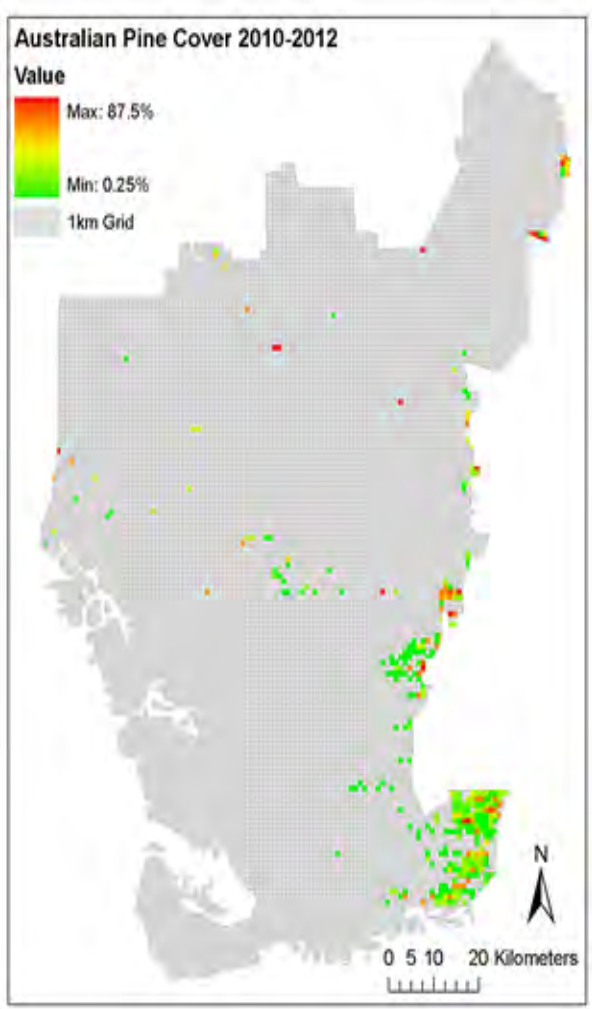
**Algal bloom indicator values are for calendar years 2007 through 2011, roughly corresponding to the water years shown.

Invasive Exotic Plant Indicator

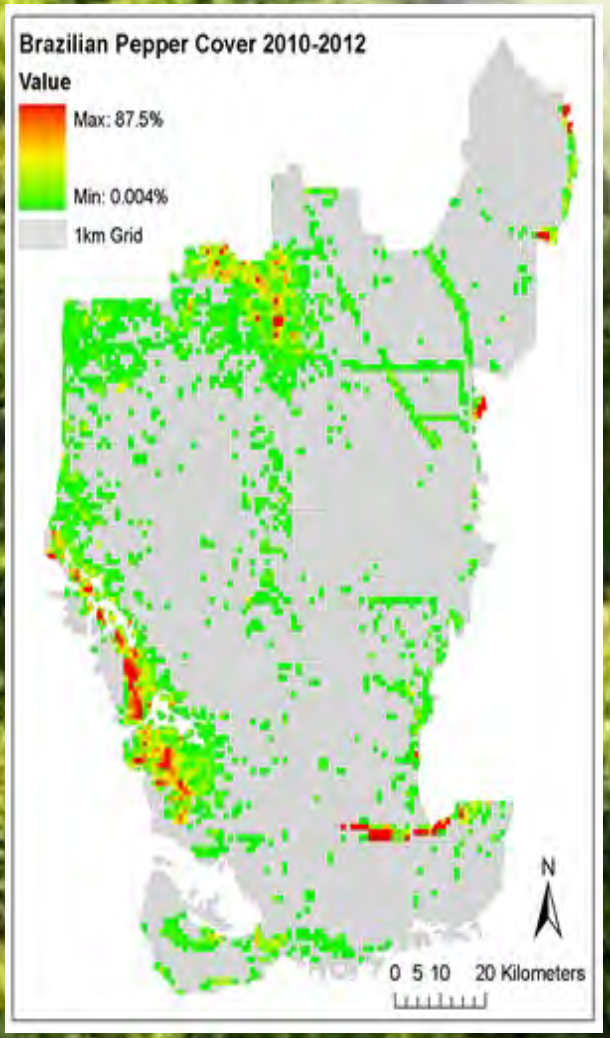
Summary Findings

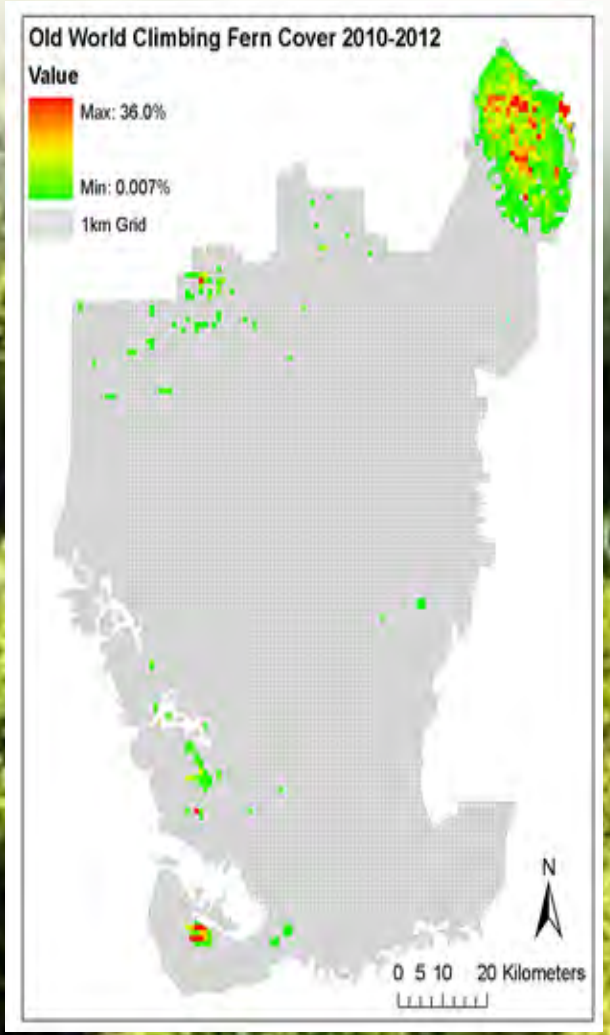
Quantitative information on the status of invasive exotic species and the effectiveness of management program is limited in many parts of the south Florida environment. Here we assess the status of priority invasive plant species within eight sub-regions of south Florida (based on RECOVER modules) using various sources of information including local expert knowledge, SFWMD monitoring information, and reports from cooperating agencies. All regions have control programs for high priority invasive plant species on public and tribal lands, and progress toward control continues for some species such as melaleuca and Australian pine. Excellent coordination among land managers and researchers is yielding successes towards containment and control of many invasive species, particularly new introductions. In addition, the development and implementation of biological controls and other control techniques continue to improve regional invasive plant programs.

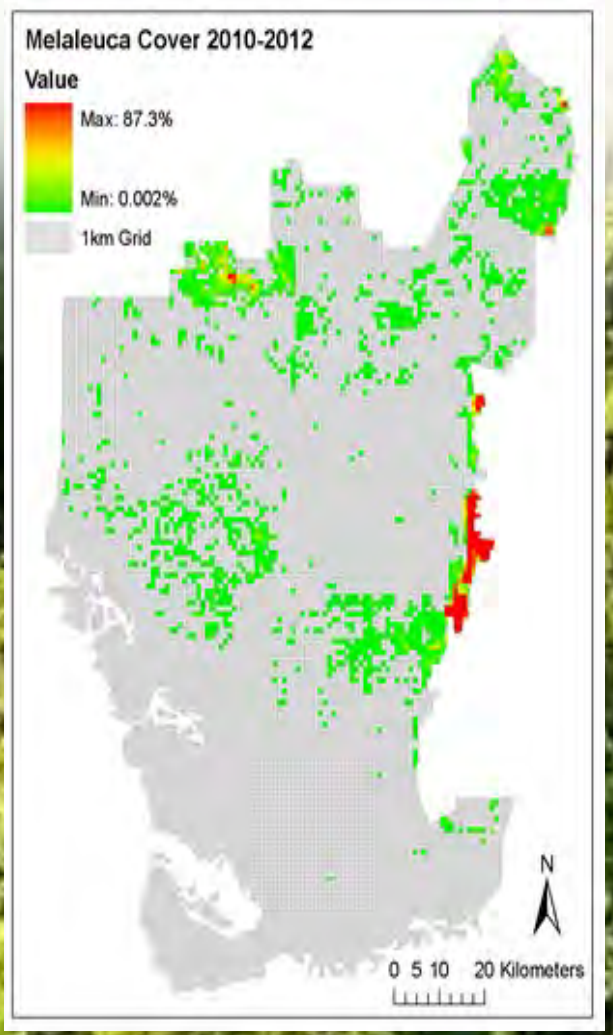
Unfortunately, many serious invaders remain problematic in most regions. For example, Brazilian pepper and Old World climbing fern continue to expand, presenting a significant threat to the ecological integrity of Everglades tree islands and other plant communities. Stagnant or decreasing funding for invasive plant management may set back recent achievements in controlling some priority species. While systematic aerial monitoring programs are established for several regions, much-needed ground-based monitoring is lacking. Such monitoring programs would help land managers contain the spread of invasive species to new areas. Finally, invasive plant management on private lands remains deficient in all regions, ensuring continued invasion vulnerability to conservation lands.



Invasive Exotic Plant Indicator







Figures show distribution and cover of Australian pine, Brazilian pepper, melaleuca, and Old Word climbing fern in the Greater Everglades region. Values represent percent cover in 1km grid. Mapping for other regions assessed in the report are currently unavailable.

Invasive Exotic Plant Indicator

Key Findings

- Most of the regions have serious invasive exotic plant problems, which are affecting natural areas and altering natural habitats and processes. Control of invasive plants is successful for a few species, but only locally on some public lands. The responses of invasive plants to ecosystem restoration vary strongly by species. Hydrologic change initiated by ecosystem restoration may inhibit the invasive potential of some species while simultaneously creating niches for new invaders. For example, the aggressive expansion of Peruvian primrose willow on the Kissimmee River floodplain is attributed to lengthened hydroperiods.
- Three biological control agents for melaleuca are well-established, and melaleuca reduction is documented. One agent for Old World climbing fern is established in some areas where it exerts pressure on the invasive fern.
- New biological control agents have been released for several other serious invasive plants, and other agents are in development for release within 1-2 years. Completion of the CERP biological control facility is anticipated in early 2013. The project will further successes in biological control throughout south Florida.
- Monitoring that would identify new invasive species or new distributions for existing species only covers the Greater Everglades regions and portions of the Kissimmee River, Lake Okeechobee, and Big Cypress regions. Therefore, the ability to determine where and when new species arrive and establish is limited. In many cases, invasive plant populations are not being systematically monitored.

- Stagnant or reduced funding for control (e.g., Everglades National Park, Florida Fish and Wildlife Conservation Commission Invasive Plant Control, USFWS) is a serious threat to long-term management success. As maintenance control is achieved for some priority species, other species continue to expand. Through coordination and collaboration, regional land managers and scientists are looking for innovations and improved efficiencies to continue progress.
- Overall, the picture is mixed for invasive plants. Although progress has been made on a number of species, we are still unable to control many species faster than they are invading and spreading. Prevention, monitoring, and control programs would have to be expanded in order to do that.

Location/ Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
KISSIMMEE RIVER				**The Good**: Successful control programs for water hyacinth, water lettuce, and melaleuca; Biological control agents for melaleuca well established. **The Bad**: Old World climbing and Brazilian pepper aggressively invading many areas within the river basin; Invasive grasses, including paragrass and limpograss, abundant in restoration areas, slowing the establishment of native flora.
LAKE OKEECHOBEE				**The Good:** Existing melaleuca control program achieving maintenance control; Efforts to control dense stands of torpedo grass fostering recovery of native flora and increased wading bird habitat in some areas. **The Bad:** Invasive grass species expanding in the western marsh; Sustained control of these species is necessary to limit spread. Increased management challenges for floating aquatic weeds.
NORTHERN ESTUARIES—EAST COAST				**The Good**: Melaleuca, Brazilian pepper, and Australian pine successfully managed on public lands; Biological control agents are exerting pressure on melaleuca and Old World climbing fern. Recent improvements in control techniques for downy rosemyrtle **The Bad**: Old World climbing fern continues to aggressively re-invade previously treated areas; Cogongrass apparently expanding but this and other species not included in indicator monitoring programs.
NORTHERN ESTUARIES—WEST COAST				**The Good**: Much progress made with floating aquatic weeds, melaleuca, and Australian pine, but significant infestations remain on private lands. **The Bad**: Brazilian pepper abundant on some public lands and widespread on private lands; Most species not included in indicator monitoring program; Little known about many invaders and not able to assess their status in an objective or systematic way.
BIG CYPRESS				**The Good**: Melaleuca and Australian pine well controlled in most areas; Biological control on melaleuca very successful; Aggressive control programs for Brazilian pepper and Old World climbing fern underway; Systematic monitoring program in place; No new serious invaders detected. **The Bad**: Substantial infestations of Brazilian pepper in the Picayune Strand and Big Cypress National Preserve; Cogongrass expanding in some areas.
GREATER EVERGLADES				**The Good**: Maintenance control achieved for melaleuca, Australian pine and Brazilian pepper in some portions of the regions; Recent control efforts in Loxahatchee NWR achieving significant reductions of melaleuca; Systematic monitoring program in place; No new serious invaders detected. **The Bad**: Aggressive spread of Old World climbing fern and Brazilian pepper threatening integrity of Everglades tree islands and other habitats; Still several other species present (e.g., shoebutton Ardisia) with little or no control effort or efficacy.
SOUTHERN ESTUARIES				**The Good**: Control programs under way for many years; significant control achieved for Australian pine. Successful early detection and control of a newly detected mangrove invader. **The Bad**: Several new species invasions, and their potential impacts unclear; Latherleaf, a serious invader of rare habitats along the southern coast of the Everglades National Park, continues to expand; Most of Florida Bay not included in any monitoring program.
FLORIDA KEYS				**The Good**: Much progress made on Australian pine, sickle bush, laurel fig, and other priority species; Well-developed management programs in place; Progress in developing region-wide early detection/rapid response network. **The Bad**: Populations of some priority species on private lands remain uncontrolled; Continued use of some invasive species in private landscapes; Potential expansion of Guinea grass a concern.

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment.

LAKE OKEECHOBEE NEARSHORE ZONE SUBMERSED AQUATIC VEGETATION INDICATOR

Summary Findings

Looking at the past 5 water years of SAV data for Lake Okeechobee the influence of Lake stage, species succession, and community recovery lag times are clearly visible. In WY 2007 the Lake experienced a severe drought achieving the lowest Lake stage on record. The resulting lack of inundated habitat resulted in SAV missing both its areal coverage and percentage vascular targets. In WY 2009 and 2010 recovery continued with areal coverage expanding until it exceeded the 40,000 acre target in WY 2010. However, in both WY 2009 and 2010, the predominant SAV species was the macroalga *Chara*, a typical pioneering species. Colonization by vascular SAV species lagged behind *Chara,* so that both the areal coverage and % vascular targets weren't achieved until WY 2011. In WY 2012, another drought reduced Lake levels, drying out habitat that had previously been colonized by vascular SAV, but at the same time allowing a lakeward expansion of SAV; consisting primarily of *Chara.* Consequently, the Lake again missed both its areal coverage and percentage vascular targets.

Lake stage generally continues to be somewhat lower than the long-term mean stage over the past several decades due to a combination of the adoption of the Lake Okeechobee Regulation Schedule (LORS) operating schedule in 2008 and a series of closely spaced drought years. As a consequence, previously SAV-dominated areas inshore have become dominated by emergent and terrestrial plants. For example, approximately 4,700 acres that was open-water SAV habitat in South Bay prior to WY 2008 has changed to emergent marsh habitat.

Key Findings

1. The reporting period encompassing WY 2008 through WY 2012 reflected a period of recovery from the drought of WY 2008 following by a decline in SAV community health resulting from the return of drought conditions in WY 2012.
2. Since WY 2008 there has been a gradual replacement of nearshore open water SAV habitat with emergent marsh and a corresponding shift of SAV more offshore; with *Chara spp.* as the predominant colonizing species.
3. If the lake continues to remain near the lower end of the desired stage envelope or lower, the enlarged marsh habitat likely will continue to occupy formerly open-water SAV habitat while SAV colonizes areas offshore which were previously too deep and light limited to support substantial underwater plant growth. This prospect is predicated on the assumption that major disturbance events such as hurricanes and droughts are infrequent.
4. *Chara spp.* areal coverage continues to remain similar to or higher than pre-hurricane levels. The location of *Chara* beds is offshore relative to its previous distribution prior to the prolonged drought of 2007-08. *Chara* probably will not re-colonize its previous range unless emergent and terrestrial plant densities markedly decrease; probably as a result of a return to higher Lake stages or passage of a tropical system containing strong winds.
5. Vascular SAV taxa areal coverage during this reporting period is lower than during the peak summer of WY 2005. This appears to be primarily due to less nearshore colonizable area associated with lower Lake Stages and lakeward expansion of emergent marsh habitat. *Potamogeton* areal coverage during WY 2012 was approximately 8% of that during WY 2005, while *Ceratophyllum* and *Hydrilla* WY 2012 areal coverage were approximately 25% of that in WY 2005. Conversely, *Vallisneria* and *Chara* in WY 2012 covered roughly 85% and 94% of the amount of area they covered in WY 2005. In the case of *Ceratophyllum*, *Hydrilla* and *Potamogeton*, it appears that these species are not colonizing further offshore at a rate proportional to their loss from nearshore open water habitat. Conversely, *Chara* and *Vallisneria* have colonized an area further offshore that is similar to the amount of nearshore habitat that has recently converted to emergent marsh habitat.

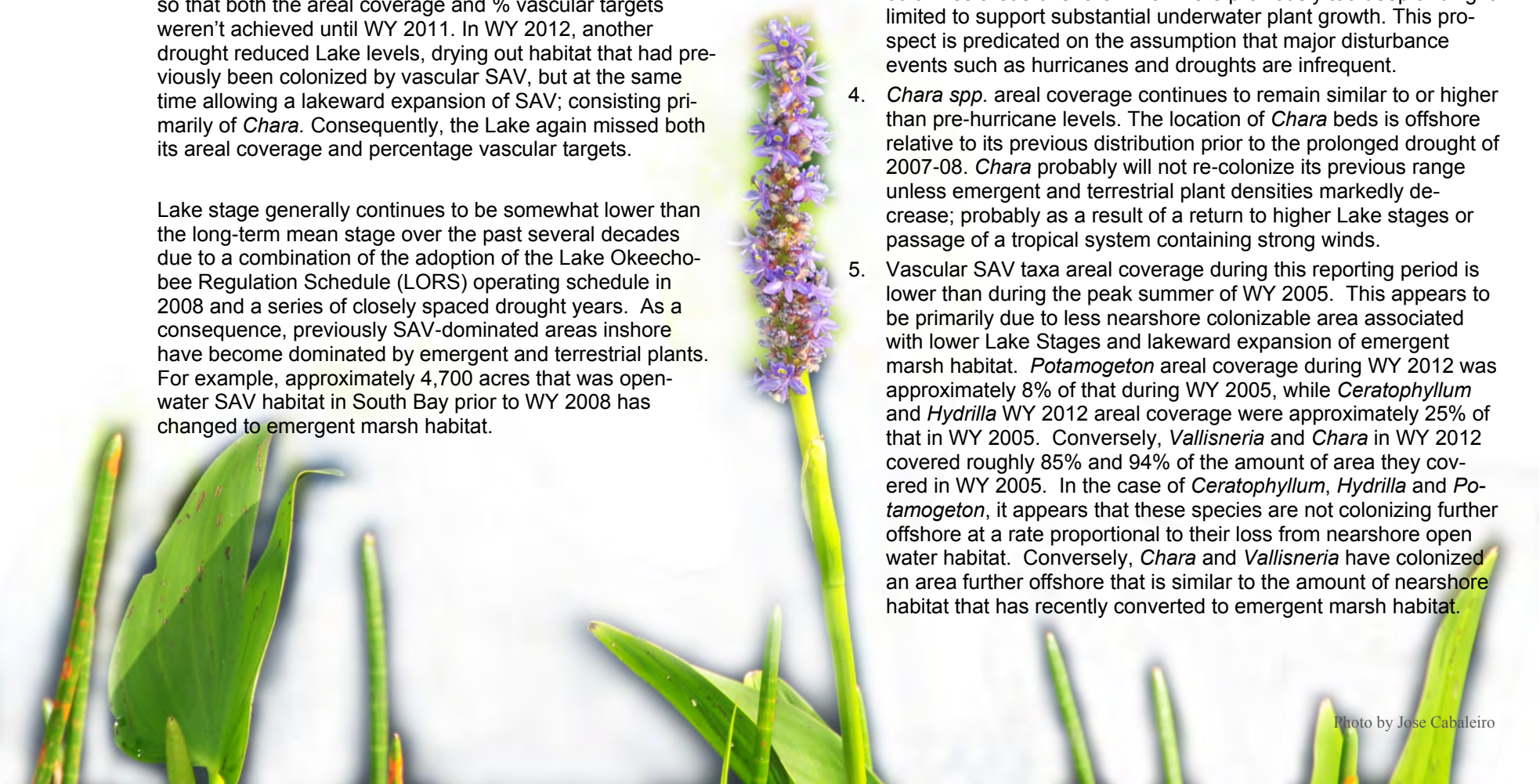
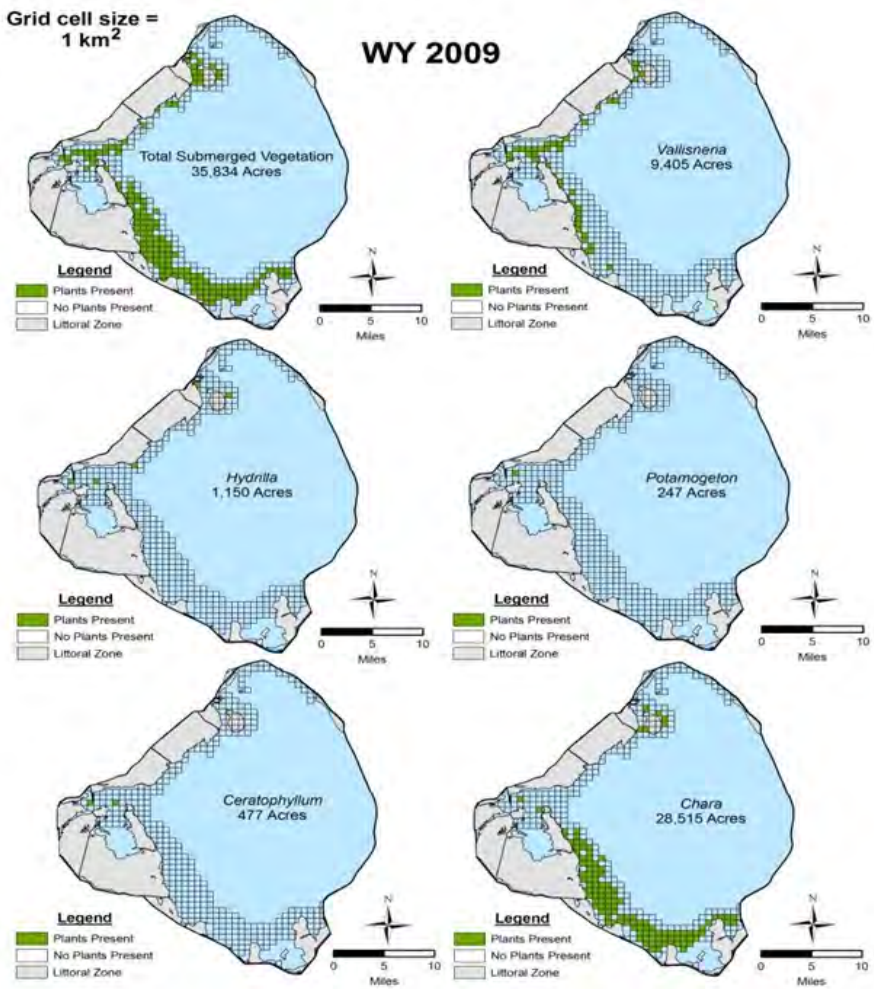


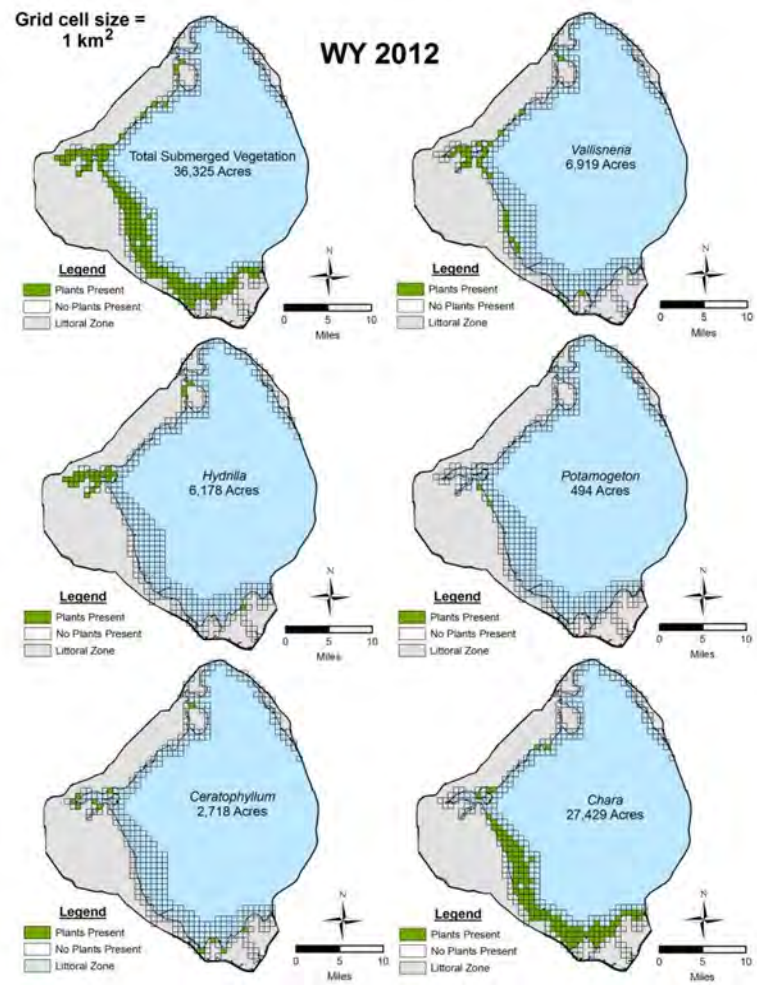
Photo by Jose Cabaleiro

6. Keeping the lake within the recommended stage envelope as often as possible is important for the continued reestablishment and maintenance of the vascular SAV community. The current lake operating schedule (LORS 2008) should assist in doing this, barring the occurrence of frequent hurricane or drought events. Maintaining the preferred range of lake stages also will enable the reestablishment of emergent vegetation in areas of the short hydroperiod marsh that have become dominated by terrestrial vegetation, and allow SAV to re-colonize areas that have become emergent marsh (although offshore beds of SAV may be lost due to increasing depth resulting in light limitation). Current risks are a) that continued low Lake stages might result in an extended recovery period once Lake levels return to more normal ranges and b) that a very rapid rise in Lake stage as occurred as a result of the hurricanes of 2004 and 2005 would nearly completely eliminate the existing submerged and emergent vegetation communities and require a multi-year recovery period before conditions could stabilize.
7. Although Lake Okeechobee SAV areal coverage and vascular, non vascular ratio is a key RECOVER performance measure the annual monitoring for this metric has always been done as an in-house effort. The SFWMD is currently reviewing all of its monitoring activities and it is therefore unclear at this time whether annual SAV mapping will remain a viable program in FY 2013. However, Lake Okeechobee scientific staff have recommended to management that this program be continued.

Photo by Leslie Haynes

Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation Indicator





Figures show Map of Lake Okeechobee with SAV areal coverage in the nearshore region for WY 2009 and WY 2012.

Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation Indicator

Location/ Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
NEARSHORE REGION **Submerged Aquatic Vegetation Areal Coverage**	●	●	⇧	Submerged aquatic vegetation (SAV) coverage has varied between approximately 28,000 and 46,000 acres since WY 2008. During this period, the Lake achieved its targets of 40,000 acres of SAV with 50% or more consisting of vascular species only once, in WY2011. In WY 2008, 2009, and 2012 neither of the two performance targets was met, while in WY 2010, the total acres target was met but the % vascular target was missed.

If Lake Stages continue to remain near the lower end of the desired stage envelope or lower, the enlarged marsh habitat likely will continue to occupy formerly open-water SAV habitat, while SAV colonizes areas offshore which were previously too deep and light limited to support substantial underwater plant growth. However, south Florida's variable climate and frequent hurricanes, coupled with the disproportion between the Lake's potential tributary in-flows and outflows can result in rapid reversals to the current situation.

Eastern Oysters Indicator

Photo by Aswani Bolety

Summary Findings

On the whole, Eastern oyster status remained constant up to 2011. Insufficient information exists for oysters in the Southern estuaries and is not being reported here. Continued monitoring in the Northern Estuaries will yield data to make trend and status assessments in the coming years and will strengthen the confidence of the status. Current conditions in the Caloosahatchee Estuary show deviations from restoration targets, therefore restoration actions are merited. For example, relatively dry years during the past three years has resulted in higher disease prevalence and increased predation and mortality of juvenile oysters and spat recruitment. Status of oysters is expected to improve if hydrologic conditions are restored to more natural patterns.

Key Findings

1. There is too much freshwater inflow into the Caloosahatchee estuary in the summer months and too little freshwater inflow into the estuary in the winter months, disrupting natural patterns and estuarine conditions. The oysters in both of these estuaries are still being impacted by this unnatural water delivery pattern. Too much fresh water impacts reproduction, larval recruitment, survival and growth. Too little fresh water impacts the survival of oysters due to higher disease prevalence and intensity of *Perkinsus marinus* and predation.
2. Overall status of oysters in all of the Northern Estuaries is below restoration targets and requires action in order to meet restoration goals.
3. Oyster responses and populations in the Northern Estuaries are below targets and may be in danger of declines under current salinity levels. Growth rates and recovery rates for abundances suggest that oyster index scores could be expected to increase given proper hydrologic conditions through restoration.
4. Restoration of natural patterns (less freshwater flows in the summer and more freshwater flows in the winter) along with substrate enhancement (addition of cultch) is essential to improving performance of oysters in the estuaries.

Continued monitoring of oysters in the Northern Estuaries and expanded monitoring in the Southern Estuaries will provide an indication of ecological responses to ecosystem restoration and will enable us to distinguish between responses to restoration and natural variation.

Eastern Oysters Indicator

Location/ Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
Northern Estuaries/ Eastern Oyster				
Caloosahatchee Estuary (Northern Estuaries)	●	●	⇔	The oysters in the Caloosahatchee Estuary are still being impacted by too much fresh water in summer and too little fresh water in the winter. Too much fresh water impacts reproduction, larval recruitment, survival and growth, while too little fresh water impacts the survival of oysters due to higher disease prevalence and intensity of *Perkinsus marinus* and predation. For example, the past 3 years have been dry years resulting in higher *P. marinus* prevalence values in oysters. Current conditions do not meet restoration criteria, signifying that this area needs further attention.
Lake Worth Lagoon	●	●	⇔	Oysters in Lake Worth Lagoon exhibit lower living densities, possibly due to high salinity conditions resulting in high predation of larvae. However, condition index and Dermo intensity of oysters is comparable to other estuaries in south Florida. Current conditions do not meet restoration criteria, signifying that this area needs further attention.
Loxahatchee River	●	●	⇔	Oysters in Loxahatchee River exhibit lower living densities, and recruitment possibly due to high salinity conditions resulting in high predation of larvae. However, condition index and Dermo intensity of oysters is comparable to other estuaries in South Florida. Current conditions do not meet restoration criteria, signifying that this area needs further attention.
St. Lucie Estuary	●	●	⇔	The oysters in the St. Lucie Estuary are still being impacted by too much fresh water in summer and too little fresh water in the winter. Too much fresh water impacts reproduction, larval recruitment, survival and growth, while too little fresh water impacts the survival of oysters due to higher disease prevalence and intensity of *Perkinsus marinus* and predation. Current conditions do not meet restoration criteria.

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment.

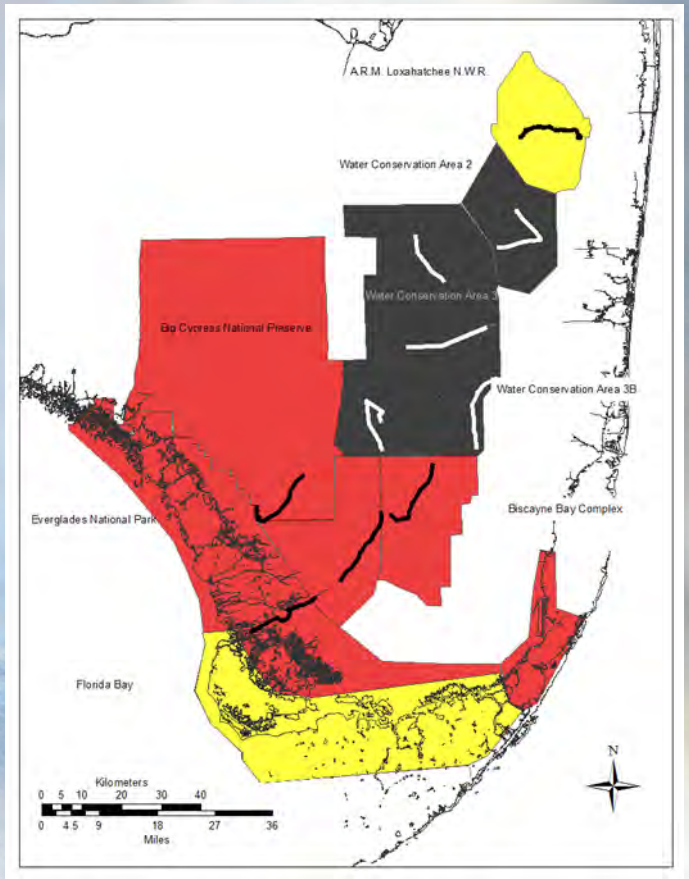
Crocodilians (American Alligators & Crocodiles) Indicator

Summary Findings

On the whole, alligator and crocodile status remained constant during water year 2012. We could not assess the Water Conservation Areas due to funding reductions in FY 12. However, the majority of locations show substantial deviations from restoration targets; therefore restoration actions are merited. Status of alligators and crocodiles are expected to improve if hydrologic conditions are restored to more natural patterns.

Key Findings

1. Alligator overall status at the A.R.M. LNWR is the highest in south Florida.
2. Overall status of alligators throughout Water Conservation Areas 2 and 3 could not be assessed due to funding cuts. This is an important region as significant restoration projects are scheduled for WCA 3.
3. Overall status of alligators throughout ENP is below restoration targets and requires action to meet restoration goals.
4. Growth and survival components for crocodiles, while below restoration targets, appear stable at this time and are expected to improve with restoration of timing and amount of freshwater flow to estuaries.
5. Restoration of patterns of depth and period of inundation and water flow is essential to improving performance of alligators in interior freshwater wetlands.
6. Restoration of patterns of freshwater flow to estuaries should improve conditions for alligators and crocodiles.
7. Continued monitoring of alligators and crocodiles will provide an indication of ecological responses to ecosystem restoration.



Water year 2012 stoplight colors for crocodilians by area.

Photo by Brent Anderson

Crocodilians (American Alligators & Crocodiles) Indicator

Location	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
American Alligator				
A.R.M. Loxahatchee National Wildlife Refuge	Yellow	Yellow	⟺	Relative density (component score = 0.83) and body condition (component score = 0.67) combined for a location score of 0.75 and so current conditions do not meet restoration criteria, signifying that this area needs further attention.
Water Conservation Area-2A	Red	Black	⟺	No data collected Spring 2012. Funds for monitoring suspended in FY12.
Water Conservation Area-3A	Yellow	Black	⟺	No data collected Spring 2012. Funds for monitoring suspended in FY12.
Water Conservation Area-3B	Red	Black	⟺	No data collected Spring 2012. Funds for monitoring suspended in FY12.
Everglades National Park	Red	Red	⟺	Relative density in all three locations within Everglades National Park is low (red). Body condition is higher (yellow) in Shark Slough, northeast Shark Slough and estuarine areas. The combined score of these two components for the overall area is 0.34, which is well below restoration criteria. Alligator hole occupancy was not include in WY12 calculation.
Big Cypress National Preserve	Red	Red	⟺	Relative density (component score = 0.17) and body condition (component score = 0.33) combined for a location score of 0.25 and so current conditions do not meet restoration criteria.
American Crocodile				
Everglades National Park	Yellow	Yellow	⟺	Juvenile growth (component score = 0.5) and survival (component score = 0.5) combined for a location score of 0.5 and so current conditions do not meet restoration criteria.
Biscayne Bay Complex	Red	Red	⟺	Juvenile growth (component score = 0) and survival (component score = 0.3) combined for a location score of 0.3 and so current conditions do not meet restoration criteria.

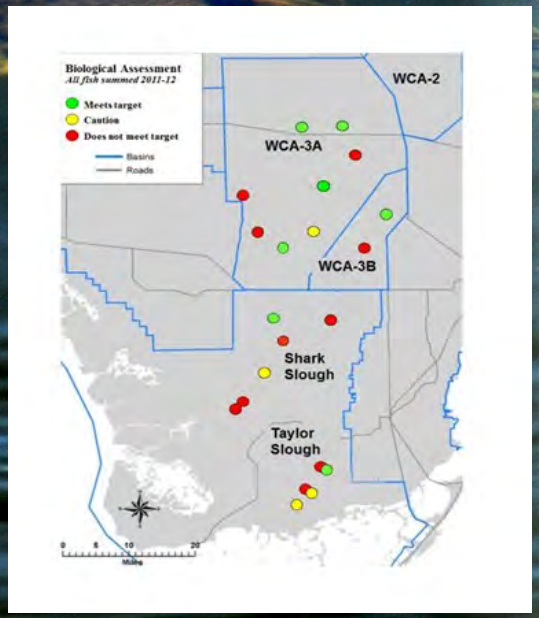
Fish & Macroinvertebrates indicator

Summary Findings

In 2011-2012, four of six monitoring sites in central Shark River Slough did not meet restoration targets (red) because of drier conditions than expected based on rainfall. The net effect was one of failure to meet targets (red) for the region. These conditions resulted from fewer fish that prefer wet conditions than expected, but levels of drought-tolerant species (flagfish and Everglades crayfish) were consistent with or above expectations. Water management is causing drier conditions than would be expected based on the amount of rainfall and water depth patterns in our baseline hydrological period of 1993 through 1999. Taylor Slough has returned to yielding many fewer fish than expected based on rainfall at two sites (red) and fewer than expected at two others; one site met the targets. Fish preferring wetter conditions were less abundant than expected, while short-hydroperiod taxa were at their targets. Taylor Slough met targets in the past two years because rainfall was low and fish abundance was also low. However, fish abundance there has continued to drop, more than expected by rainfall. Results were mixed in Water Conversation Areas (WCA) 3A and 3B, yielding a yellow for both regions. In WCA 3A, two sites yielded fewer fish than expected based on rainfall and one yielded more than expected, but three others were within desired ranges. There were fewer fish than expected in southern WCA 3B (red). The long-term monitoring program indicates that water management was closer to targets in 2007 through 2010 than in years 2001 through 2006, but then appeared to over-dry the Southern Everglades in 2011-2012. Monitoring data indicate that non-native taxa continue to be most common at edge habitats, though widespread in Everglades marshes, and their frequency is increasing in Taylor Slough following a drop in 2010. This trend should receive further attention.

Key Findings

1. All but one of the sites coded red for fish density resulted from fewer fish than expected based on observed rainfall, and most were in Shark River and Taylor Slough. Shark River Slough was scored as not meeting targets (red) overall.
2. Taylor Slough showed an improvement in 2007 through 2010 compared to previous years (2001-2006), but then deteriorated in 2011. Overall, Taylor Slough is assigned a yellow light.
3. Results were mixed in WCA 3A, and the overall assessment is caution (yellow). There was evidence of more frequent drying than expected from observed rainfall in the western area. Everglades crayfish were infrequently collected in WCA 3A in the baseline period and afterwards.
4. There were no consistent deviations from rainfall-based expectations in WCA 3B for all fish summed.
5. Non-native fish are generally 2% or fewer of the fishes collected at all monitoring sites. However, higher numbers, particularly of Mayan cichlids, have been noted at the mangrove edge of Shark River Slough and Taylor Slough, in the Rocky Glades, and in canals in general. Non-native species were knocked back by the cold months in January, 2010, but appear to be increasing again in 2011-2012.
6. The target hydrological years for this assessment include 1993-1999. Forecasting models (statistical models derived by cross-validation methodology) that link regional rainfall to surface water-depth at our monitoring sites were used to model hydrology. Alternative hydrological model outputs, such as those derived by the Natural System Model, generally yield longer target hydroperiods than used here leading to more frequent impacts.



Water year 2012 stoplight colors for fish for WCA 3 and ENP by sample site. *Dots show location of long-term study sites and the value of the total fish part of the indicator as an example of spatial coverage. The stoplight colors in the table that follows are the average of all sites within each geographic area for each part of the indicator.*

Fish & Macroinvertebrates indicator

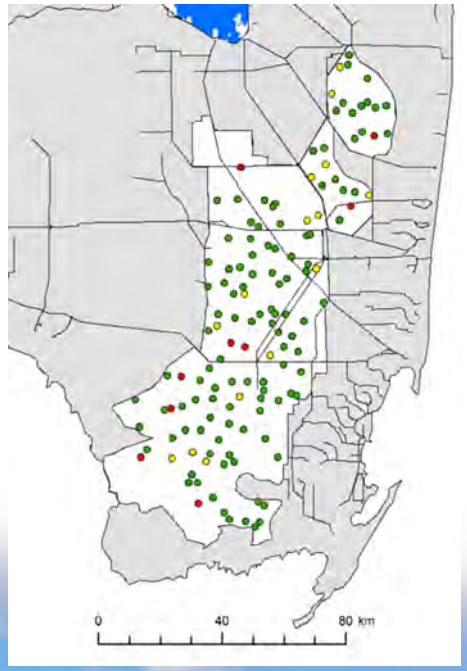
Location/Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
Water Conservation Area 3A				
Total Fish	🟡	🟡	⟺	Fewer than expected in western sites
Non-Native Fish	🟡	🟢	⟺	Very few collected this year. Relative abundance is very low.
Bluefin killifish	🟡	🟡	⇩	Fewer than expected from rainfall
Flagfish	🟢	🟢	⟺	Abundance at or above expected
Eastern mosquito fish	🟢	🟡	⇧	More than expected at some sites
Water Conservation Area 3B				
Total Fish	🟢	🟡	⇩	Fewer than expected at one site
Non-Native Fish	🟢	🟢	⇧	Very few collected this year. Relative abundance is low.
Bluefin killifish	🟢	🔴	⇩	Fewer than expected from rainfall
Flagfish	🟢	🔴	⇧	More than expected based on rainfall
Eastern mosquito fish	🟢	🟢	⟺	Abundance as expected based on rainfall
Shark River Slough				
Total Fish	🟡	🔴	⇩	Fewer than expected.
Non-Native Fish	🟡	🟡	⟺	Present, but less than 1% everywhere. Consistent with past years, most non-native fish were caught in southern SRS.
Bluefin killifish	🟡	🔴	⇩	Fewer than expected
Flagfish	🟡	🟡	⟺	More than expected
Eastern mosquito fish	🟢	🟡	⇩	Fewer than expected
Everglades Crayfish	🟡	🟢	⟺	More abundant
Taylor Slough				
Total Fish	🟡	🟡	⇩	Fewer than expected, very close to red
Non-Native Fish	🟡	🟡	⇩	Present but fewer than 2%
Bluefin killifish	🔴	🔴	⇩	Fewer than expected
Flagfish	🟢	🟢	⟺	At expected abundance
Eastern mosquito fish	🟡	🟢	⟺	At or below expected abundance
Everglades Crayfish	🔴	🟢	⟺	At or above expected abundance

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment.

Periphyton & Epiphyton indicator

Summary Findings

Many of the sites coded as “altered” (red) are near the peripheral canals surrounding the wetlands, or in drainages downstream of canal inputs (see map). In WCA-1(Arthur R. Marshall Loxahatchee National Wildlife Refuge), canals deliver above-ambient concentrations of both nutrients and calcium carbonate, causing changes in periphyton quality, including increased Total Phosphorus (TP) from nutrient enrichment and reduced organic content from calcium carbonate inputs. In WCA-2A, long-term delivery of above-ambient Phosphorus (P) in canal inputs has caused enrichment cascades throughout most of the system. This is most severe in the northeast portion of this wetland, where monospecific cattail stands predominate, precluding periphyton sampling. Enrichment in central WCA-3A, noted in 2005 and 2006, was less pronounced in 2007, while signals of enrichment were noted near the peripheral canals. Shark River and Taylor Sloughs have remained relatively free of enrichment or hydrologic modifications in the sampled areas. “Cautionary” points in southern Shark Slough are likely reflecting “natural” enrichment from waters of Florida Bay.



Water year 2012 stoplight colors for periphyton by sample site.

Key Findings

1. A total of 7% of sites had red-coded periphyton TP levels. The average number of these “failure” sites was lower in 2009-2010 (8%) than 2005-2008 (20%), primarily due to a reduction in the number of altered sites in WCA-3A, perhaps resulting from reduced inflows to this basin during relatively dry years and decreased P concentrations.
2. Similar to prior years, a total of 16% of sites had yellow-coded (cautionary) periphyton TP levels, and were primarily located downstream of canal inputs.
3. A total of 40% and 43% of sites were coded yellow or higher for biomass and species composition (not shown), primarily due to loss of biomass and native species.
4. Continued input of above-ambient P concentrations will both increase severity of enrichment effects near canals and cause these effects to continue to cascade downstream of inputs.
5. Increased input of water through restorative projects may increase periphyton development in areas formerly dry.

Photo by Franco Tobias

Periphyton & Epiphyton indicator

Location/Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
Arthur R. Marshall Loxahatchee National Wildlife Refuge				
Quality	🟡	🟡	⟺	Problems are evident along the boundaries, where canal inputs of P and carbonates are changing quality and composition.
Biomass	🟢	🟢	⟺	
Composition	🟡	⚫	⟺	
Water Conservation Area 2A				
Quality	🟡	🔴	⇧	Historical above-ambient inputs of P continue to degrade periphyton.
Biomass	🟡	🟡	⟺	
Composition	🟡	⚫	⟺	
Water Conservation Area 3A				
Quality	🟡	🟡	⟺	Water levels are too deep to allow formation of calcareous mats; canal P input further reduces biomass.
Biomass	🟡	🔴	⇧	
Composition	🟡	⚫	⟺	
Everglades National Park Shark Slough				
Quality	🟡	🟡	⟺	P from the S-12 structures and increased coastal P encroachment are reducing periphyton quality.
Biomass	🟡	🟡	⟺	
Composition	🟡	⚫	⟺	
Everglades National Park Taylor Slough				
Quality	🟢	🟢	⇩	Periphyton quality is compromised in upper Taylor Slough near S-332 detention ponds.
Biomass	🟢	🟢	⟺	
Composition	🟢	⚫	⟺	

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment. Each wetland basin is scored with a red, yellow or green symbol for each indicator, based on the proportion of sites falling within these categories in assessment (yellow if > 25% of sites are coded yellow or red; red if > 50% of the sites are red). Biomass = ash-free dry mass (g m-2), quality = total phosphorus content (mg g-2) and community composition = non-calcareous diatom species (%). Black circles indicate no data collected due to lack of funding.

Wading Birds (Wood Stork & White Ibis) indicator

Summary Findings

Exceptionally cold winter conditions and rapid and widespread drying/drought conditions of the marsh surface by the end of the nesting season resulted in generally poor nesting conditions for wading birds in 2011.Nest starts were mediocre by comparison with recent years, and nest success was poor, with >80% abandonment of Wood Stork nests. All wading bird indicators showed little change in trend or degree in 2011.
One indicator (ibis supercolony nesting) now routinely exceeds the target while the other three appear to have reached a plateau well below the desired target. Although proportion of nesting that occurs in the coastal zone has improved in recent years, (14 – 21%), it remains far from the 70% typical of the predrainage period. Nonetheless, storks seem committed to an increased tendency to nest in the coastal zone. The ratio of tactile foragers (storks and ibises) to sight foragers (Great Egrets) has shifted little in the past five years and is very far from the 30:1 ratio typical of predrainage colonies. Finally, during the last two years, storks have not initiated nesting until early March, some of the latest initiations on record. This practically guarantees that stork reproduction will continue into the wet season, when foraging opportunities disappear with rising water, and nests are routinely abandoned. While all of the information for the 2012 spring nesting season are not yet in, none of these trends appear to have changed substantially.

Key Findings

1. During the last five years, the trend for stork initiations has been towards later rather than earlier nesting (2009 was an exception). The nesting date index is numerical, with a 1 (March) being less desirable than a 5 (November). The 5-year running average index in 2011 was 2.4. The restoration target corresponds to nesting dates earlier than December 30th (4 – 5). This trend does not meet the restoration target.
2. The proportion of nesting birds occurring in the headwaters/ecotone in 2011 was 17%, and the 5-year running average was 18%, a considerable increase over the average of 8.1% over the last ten years. Storks have remained in most of the novel coastal colonies that initiated in the last ten years, suggesting the coastal ecosystem has better carrying capacity. However, the goal of 70% or greater of the birds nesting in the coastal zone remains distant.
3. The ratio of ibis+stork nests to Great Egret nests in 2011 (2.2:1) is still far below the 30:1 characteristic of predrainage conditions. In addition, there has been only a slight increase over the average of the last ten years (2.97), especially compared with the target ratio.
4. The frequency of exceptionally large ibis nesting events has improved dramatically since the late 1990s, and the mean interval between these events has changed from over 40 years to less than three in most recent years. While neither 2010 nor 2011 was an exceptional nesting year, the 5-year running average remains at 1.4 years, a considerable improvement and still within the restoration target of 1.45 years. This indicator of restored conditions therefore appears to have been met for every one of the last seven years.
5. With the exception of large ibis nestings, trends for wading bird indicators are stable (proportion in headwaters, ratio of tactile to nontactile feeders) or declining (timing of stork initiation). This suggests that progress in the wading bird indicators has stalled, and that little functional progress has been made in restoration of these indicators in the last five years.

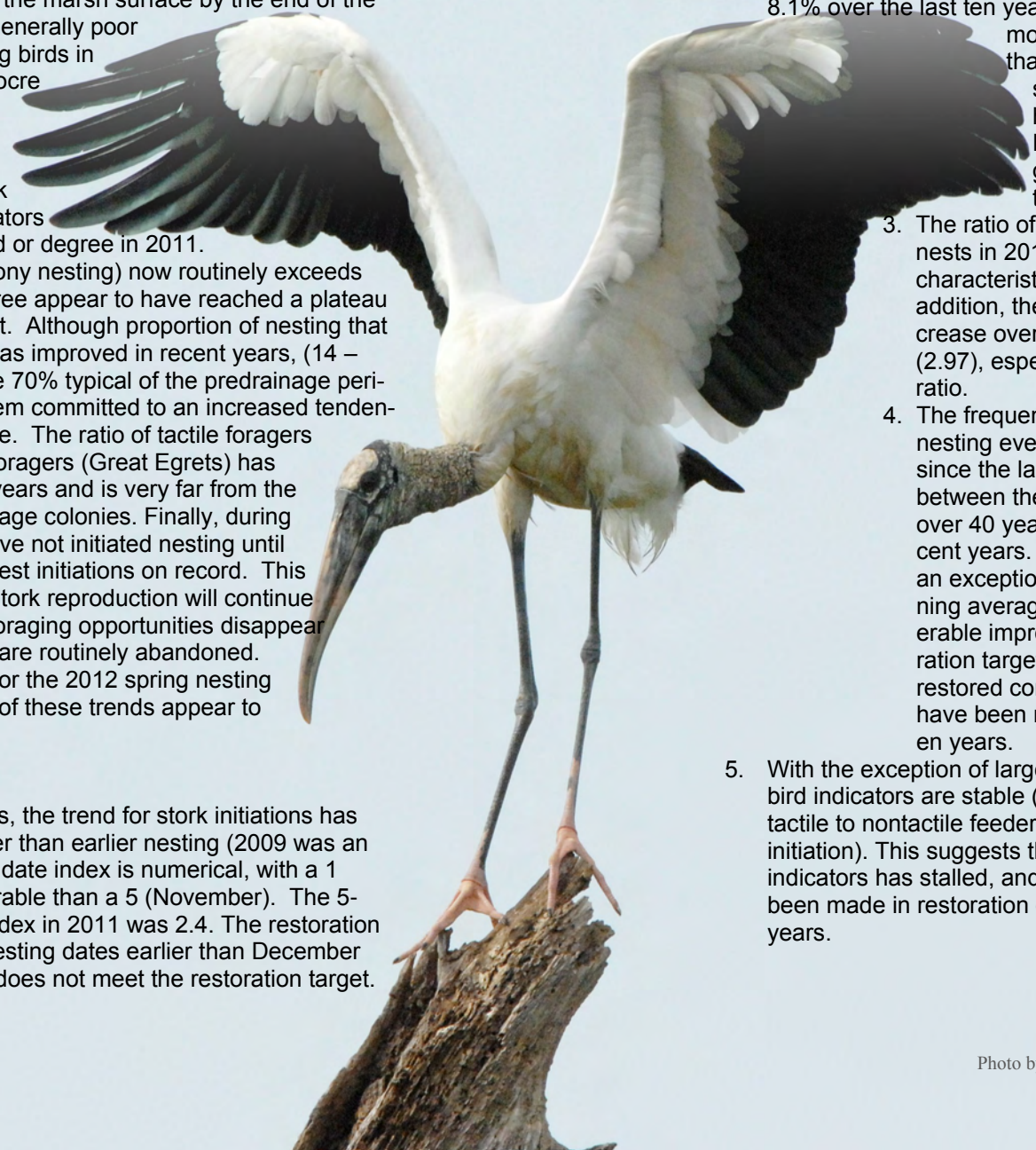


Photo by Brent Anderson

Wading Birds (Wood Stork & White Ibis) indicator

LOCATION/ PERFORMANCE MEASURE	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
Wading bird Indicator Summary	🔴	🔴	⇔	Overall, three out of four indicators are red because they do not meet performance criteria and do not show progress in that direction.
Ratio of Wood Stork + White Ibis nests to Great Egret nests	🔴	🔴	⇔	This indicator is well below the threshold of 30:1 that was typical of predrainage conditions, and has not improved markedly in recent years.
Month of Wood Stork nest initiation	🟡	🟢	⇔	Wood Storks nested markedly later than the November-December initiation typical of the predrainage time period, and has resulted in such poor nest success that the population is probably a demographic sink.
Proportion of nesting in headwaters	🔴	🔴	⇔	While some progress was made in this indicator during the mid-2000's, there is no evidence now of increased use of the coastal zone by nesting wading birds.
Mean interval between exceptional ibis nesting years	🟢	🟢	⇧	Ibises have nested in exceptional aggregations on at least a 3-year cycle in recent years, and this indicator now regularly exceeds the restoration threshold.

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment.

Southern Estuaries Algal Blooms indicator

Summary Findings

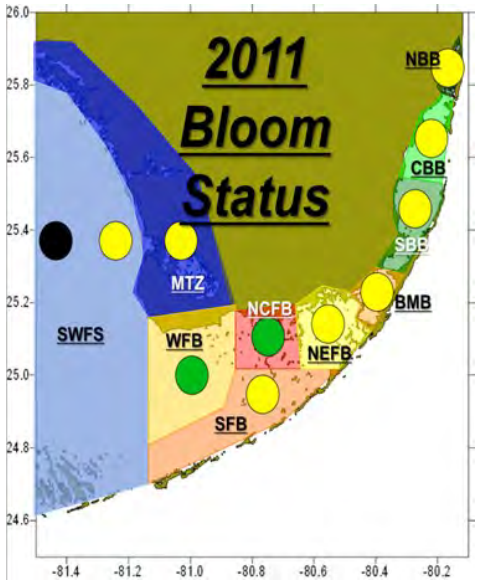
During the 2010-2011 reporting period (here reported as calendar years), no severe algal blooms were observed in the waters of Southern Coastal System estuaries (including Florida Bay, Biscayne Bay, and Whitewater Bay) and the Southwest Florida Shelf (SWFS). However, the strength of this assessment was decreased because coastal water quality monitoring programs used to develop the Algal Bloom Indicator (as chlorophyll-*a*) were altered due to funding cuts during the reporting period. Bias introduced by changing both number and location of monitoring stations required a significant new effort to adjust the stoplight threshold limits. For example, offshore sites on the SWFS were eliminated in 2010 and these stations typically have lower chlorophyll-*a* concentrations than inshore stations. Using inshore results in 2010 and 2011 with thresholds derived from long-term combined inshore and offshore values, scores for the SWFS would have been red in 2010 and 2011. For this report, the threshold had to be re-calculated using only the remaining (nearshore) stations in the section and the offshore section is listed as non-reporting due to this lack of data (black).

Key Findings

1. No chlorophyll-*a* concentrations indicative of severe algal bloom conditions were noted in 2010 or 2011 in the region.
2. The majority of sub-regions assessed showed chlorophyll-*a* concentrations above typical (median) historic levels, indicating moderate (yellow) algal bloom potential.
3. Reductions in funding for coastal water quality monitoring (RECOVER MAP, SFWMD, and NOAA) resulted in the loss of our ability to assess algal blooms over most of the SWFS.
4. No long-term trends in the Algal Bloom Indicator were observed. A two-year prospectus is not provided here because past blooms have been related to major disturbance events, such as runoff pulses and wind/wave impacts of hurricanes, and nutrient releases from seagrass die-off events. Such events are not reliably forecast. Water quality degradation reflected by this indicator is not expected to occur in two sub-regions where CERP projects are being implemented (NEFBa and SBB).

KEY RECOMMENDATIONS

1. Sustained water quality monitoring is needed to assess CERP effects on coastal ecosystems, including assessment via this indicator. Reductions made to these programs have reduced the rigor of the Algal Bloom Indicator. For example, information on the SWFS sub-region is now spatially reduced. With less frequent sampling (from monthly to bimonthly) and fewer stations through most of the Southern Coastal System, the rigor of this indicator and our ability to detect restoration effects needs to be re-evaluated.
2. Monitoring of these regions within Florida Bay and Biscayne Bay is essential to assess the impact of the C-111 Spreader Canal Western and Biscayne Bay Coastal Wetlands projects, components of which are presently operational.
   Additionally, changes in operation of the C&SF system associated with the recently approved Everglades Restoration Transition Plan and changes along the Tamiami Trail (Modified Water Deliveries implementation) are anticipated to affect timing and volume of water delivery to the southern coastal systems. Robust assessment is required to improve ability to distinguish between restoration effects and other human or naturally driven changes.
3. Given that the Central Everglades Planning Project (CEPP) is targeting increased flow through Shark River Slough (SRS), water quality monitoring on the SWFS is needed to assess this indicator as CEPP proceeds. A National Research Council review panel cited the potential for increased SRS flow to cause a significant increase in algal blooms in this region, impacting the Florida Keys National Marine Sanctuary. While the Everglades and most of Florida Bay are phosphorous-limited, the SWFS is nitrogen-limited; increasing flows with low phosphorous (but high nitrogen) may still cause an increase in algal blooms on the SWFS.



Map of the SCS with stoplight ratings by sub-region.

Southern Estuaries Algal Blooms indicator

Location/ Performance Measure	2008 LAST STATUS	2012 CURRENT STATUS	CURRENT STATUS
NORTH BISCAYNE BAY (NBB)	Yellow	Yellow	Chlorophyll-*a* concentrations during 2010 and 2011 were higher than typical historic concentrations in this region, indicating a potential for algal blooms.
CENTRAL BISCAYNE BAY (CBB)	Yellow	Yellow	Chlorophyll-*a* concentrations each year since 2002 were higher than typical historic concentrations in this region, indicating a long-term increase. While these concentrations are not considered harmful, they may indicate that there was an increased potential for algal blooms over the past decade.
SOUTH BISCAYNE BAY (SBB)	Yellow	Yellow	Chlorophyll-*a* concentrations in 2010 and 2011 were higher than typical historical concentrations in this region, indicating a potential for algal blooms.
BARNES, MANATEE AND BLACKWATER SOUNDS (BMB)	Yellow	Yellow	This region experienced an unusual cyanobacterial ("blue-green algae") bloom in 2006-2008. The bloom was initiated by a large spike in phosphorus from a combination of highway construction and canal releases in association with an active hurricane season. Currently, chlorophyll-*a* concentrations are above typical historic values, indicating a potential for renewed blooms.
NORTHEAST FLORIDA BAY (NEFB)	Green	Yellow	This region was also impacted by the cyanobacterial bloom in Barnes, Manatee and Blackwater Sounds but returned to baseline levels in 2007. Currently, chlorophyll-*a* concentrations are above typical historical values, indicating a potential for renewed blooms.
NORTH-CENTRAL FLORIDA BAY (NCFB)	Green	Green	The current status is due to the lack of a seasonal cyanobacterial bloom from 2007 through 2011. These blooms do not appear every year, but intense blooms have occurred intermittently in this region over the past 15 years.
SOUTH FLORIDA BAY (SFB)	Green	Yellow	Chlorophyll-*a* levels are somewhat higher than typical historical concentrations, but are not indicative of an intense bloom. Blooms have occurred in, or extended from the north-central region into this area intermittently over the past 15 years and are expected to continue to do so in future, especially after the passage of hurricanes.
WEST FLORIDA BAY (WFB)	Green	Green	Since 2006, the seasonal diatom blooms in this sub-region have not been as dense or widespread as in the past.
MANGROVE TRANSITION ZONE (MTZ)	Yellow	Yellow	Chlorophyll-*a* concentrations since 2008 were higher in this region than typical historic concentrations, indicating a potential for intense blooms. This region includes Whitewater Bay and riverine estuaries.
SOUTHWEST FLORIDA SHELF (SWFS)	Green	Black	**A reduction in monitoring implemented in 2010** makes it impossible to assess the status of the offshore area of the SWFS. Chlorophyll-*a* concentrations during 2010 and 2011 in the most inshore area were higher (yellow values) than typical historical concentrations.

Note: Years reported here are calendar years and not water years.

No trend arrows are provided for this indicator because scientists felt that there is very low confidence in ability to forecast changes because of variability of bloom causation and occurrence as well as diminished monitoring.

Florida Bay Submersed Aquatic Vegetation indicator

Summary Findings

The Composite Index that gives a summary of overall system status for Submersed Aquatic Vegetation (SAV) in Florida Bay (Figure 1) remains unchanged in 2010 and 2011 from 2009 showing good scores in the Northeast, Central and Western Zones and fair scores for the Transition and Southern Zones.

Key Findings

1. The Abundance Index (combining both spatial coverage and average density indicators) were good in the NE and Western Zones, fair in the Central and Transition and poor in the Southern Zone, unchanged from 2009. Underlying indicators reflect generally good spatial coverage of SAV in almost all basins throughout the bay, except in Joe Bay, indicating no large-scale die-off events. There were mixed results for the density indicator, reflecting sub-optimal density where seagrass occurred, reducing the overall Index scores for some basins. Notably abundance remained poor in both Madeira Bay and Twin Key Basin.
2. in general, the Target Species Index, which combines indicators for species diversity and presence of desired species, showed continued "good" status in the NE, Central and Western Zones and maintenance of improvement from poor to fair in the Southern Zone since 2009, reflecting increased community diversity. Only the Transition Zone showed continued weakness, with Target Species Index scores remaining fair for 2010-11. Most zones showed scores of "good" for presence of target species but the Transition Zone's aggregate score of poor reflected the low Species Dominance scores for the lack of community diversity.
3. In all basins, where there have been changes in the past few years, they have been in the positive direction, reflecting continued improvement since the mid-2000's when hurricanes and a prolonged micro-algal bloom negatively impacted the SAV community. Despite some incidents of high salinity in recent years, large-scale die-off has not been observed. Some basins reflect one or more indicator scores in the fair or poor range. It is expected that with continued improvements to hydrology via restoration, that increases in these scores may occur in the near-term.

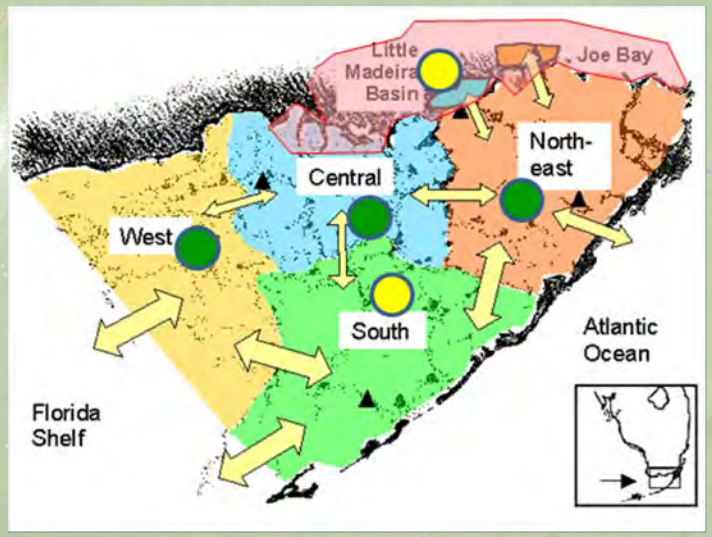


Figure 1. Map of SAV Indicator Zones with 2011 status

Florida Bay Submersed Aquatic Vegetation indicator

Location/ Performance Measure	WY 2009 LAST STATUS	WY 2011 CURRENT STATUS	CURRENT STATUS
Florida Bay Northeast Zone			
Abundance	Good	Good	The aggregate Abundance Index is in the good range for the NE Zone. The underlying component spatial extent scores remained at 0.93 (good) for years '10 and '11 (max=1) as the effect of the '05-'08 algal bloom on SAV area covered have receded. Extent for all basins is in the good range. Density remains good for this zone and Long Sound and Eagle Key Basin have improved to good but declined to fair in Davis Cove.
Target Species	Good	Good	Target species aggregate score remained at good for this zone in '10-'11, with good scores for target species indicator but fair or poor scores for most basins in the underlying species dominance score, meaning that desired mixed species communities have not yet been well-established.
Florida Bay Transition Zone			
Abundance	Fair	Fair	The aggregate Abundance Index for the Transition Zone was fair in '10-'11, with the density index remaining at fair levels since declining from good in '06. The spatial extent component of the index is in the good range and scored good for all basins in '10 though declining to fair in Joe Bay in '11.
Target Species	Fair	Fair	The aggregate Species Index remained fair for'10 and '11 in the Transition Zone. The aggregate species dominance indicator remained poor in both years, improving to fair in L. Madeira and declining to fair in Barnes Sound. The target species indicator averaged good overall but declined to poor in Duck and Eagle Key, while improving to good in L. Blackwater.
Florida Bay Central Zone			
Abundance	Fair	Fair	The Abundance Index in the Central Zone was in the fair range for '10-'11, since improving from poor in '08. Spatial coverage was good in all basins but low density in most basins (except Rankin, where it was good) reduced the density score and the overall score for the zone.
Target Species	Good	Good	The Species Index remained good for the Central Zone in '10 and '11 reflecting increasing presence of target species (Halodule and Ruppia). Species Dominance sub-scores remain only fair in this zone as most basins are overly dominated by Thalassia.
Florida Bay Southern Zone			
Abundance	Poor	Poor	The Southern Zone continues to reflect a poor rating in the Abundance Index in both '10 and '11 as in previous years. Despite high scores for spatial extent in all basins, aggregate scores were reduced by densities remaining in the fair or poor range and notably falling to poor in Twin Key Basin in '11.
Target Species	Poor	Fair	The Species Index remained in the fair range in the Southern Zone for '10-'11 after improving in '09 from several year in the poor range. The species dominance component improved to fair for both years while the target species index remained at fair.
Florida Bay Western Zone			
Abundance	Good	Good	The Western Zone had high scores for the Abundance Index, with values in the good range for both extent and density in '10-'11, sustaining the improvement from fair that occurred in '08.
Target Species	Good	Good	The Western Zone continues to reflect good scores for the Species Index, as the target species component continues in the good range since '06. The underlying species dominance sub-score improved to good in Johnson Key and remained fair in other basins and fair overall. Target species scores show a good mix of desired species throughout the zone and a good overall score.

Photo by Jose Cabaleiro

Juvenile Pink Shrimp indicator

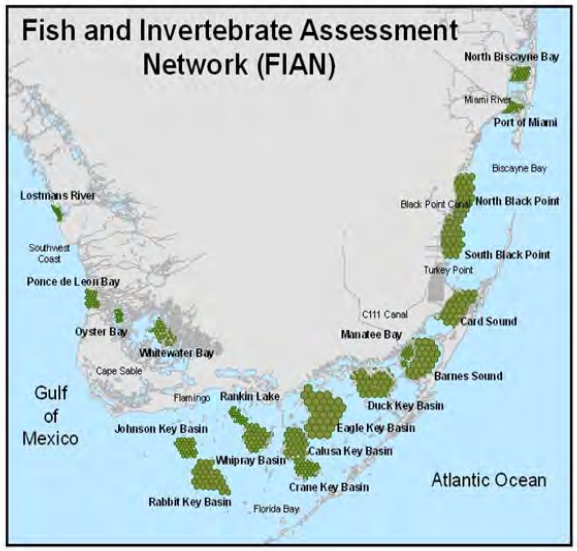
Summary Findings

MAP's Fish and Invertebrate Assessment Network (FIAN) determined the water-year 2011 and 2012 status of pink shrimp in 19 nursery locations in three southern coastal regions, as shown below in stoplight colors. Abundance (number per square meter) during the season of peak abundance, September and October, was the indicator. The first five MAP water years, 2006-2010, provided the basis for determining current and past year status at each location. For each location, the 5-yr distribution of abundance, as reflected in 1st and 3rd percentiles, provided thresholds between good (highest 25%), poor (lowest 25%), and neutral (in between the lowest 25% and the highest 25%). By comparison to the 5-yr base, water years 2011 and 2012 were poor (red) or neutral (yellow) for pink shrimp in most locations. Status was good (green) in Whipray Basin in 2011 and 2012, in Manatee Bay and Lostmans River in 2011, and in Calusa Key Basin and Crane Key Basin in 2012. FIAN sampling was discontinued after water year 2012 September-October sampling for lack of funding.

Key Findings

1. Pink shrimp status was poor or neutral in all but one Biscayne Bay location in both 2011 and 2012. Pink shrimp status was good in Manatee Bay in 2011. The regional overview pink shrimp status for Biscayne Bay was poor for both 2011 and 2012. The 7-yr (2006-2012) downward trend was not significant ($p>0.05$) for any Biscayne Bay location.
2. Pink shrimp status was poor in three out of eight Florida Bay locations in 2011, neutral in four locations, and good in one location, Whipray Basin. 2012 pink shrimp status was good in three locations. Pink shrimp status declined from neutral to poor in Johnson Key Basin, where juvenile shrimp are most abundant in south Florida. The regional overview pink shrimp status was neutral in both years. Downward trends in all Florida Bay areas were not significant.
3. Pink shrimp status in the lower southwest mangrove coast was good only in Lostmans River in 2011. It was poor in Ponce de Leon Bay in both 2011 and 2012 and in Oyster Bay in 2012. The overview pink shrimp status for this area was neutral for 2011 and poor for 2012. A significant 7-yr downward trend was noted in Oyster Bay. Other downward trends were not significant. The 7-yr trend was upward but not significant in Lostmans River.
4. The 7-yr trend is downward in 18 of the 19 locations; but significantly ($p\leq0.05$) so only in Oyster Bay. The upward trend at Lostmans is not significant. Downward trends in all but one location suggest a coast-wide influence. Over the 7 years, maximum abundance usually occurred in 2006, and lowest abundance often occurred in 2011 and 2012.
5. Current status refers to water-year 2012 (September-October of calendar year 2011).

Photo by NOAA



Juvenile Pink Shrimp indicator

Zone/Performance Measure	2011 LAST STATUS	2012 CURRENT STATUS	TREND	CURRENT STATUS
Biscayne Bay Region				
Regional Overview	🔴	🔴	⇩	In regional overview, pink shrimp density in Biscayne Bay was particularly poor in 2012, as well as 2011, compared to other regions.
North Bay	🟡	🟡	⇩	For this site, the bar was set in 2006, which strongly influenced the status thresholds, and no year has performed as well since. 2012 density was not exceptionally low.
Port of Miami	🔴	🔴	⇩	Although density was slightly higher in 2012 than in 2011, it was still in the red zone based on thresholds set by previous years.
North Black Point	🔴	🟡	⇩	This site had a moderate density of shrimp (~3.5/m2 in 2005 and ~2.3/m2 in 2009. In 2012, it was less than 1.5.
South Black Point	🔴	🟡	⇩	Density was slightly higher in 2012 (1.0/m2) than in 2010 (~0.5), but the 5 previous years were better (almost 3 in 2006)
Card Sound	🟡	🔴	⇩	Pink shrimp density was consistently around 1/m2; however it was above 1.0 most years and below 1.0 in 2011, as in 2011.
Manatee Bay	🟢	🟢	⇩	This is an area of extreme low shrimp density (~0.2/m2, at best, in 3 of 5 years. Almost zero in 2011 and 2012.
Florida Bay Region				
Regional Overview	🟡	🟡	⇩	The regional overview for Florida Bay 2012 was neutral, however within-region status ranged from good (3 locations) to poor (one location).
Duck Key Basin	🟡	🟡	⇩	Pink shrimp density was close to zero at this location in all years, including the base years, and density in 2012 was almost zero, although within the neutral band.
Eagle Key Basin	🔴	🟡	⇩	Pink shrimp density was close to zero at this location in all years, including the base years. Average density in 2012 was only slightly lower than in most previous years.
Calusa Key Basin	🔴	🟢	⇩	The higher density at this location approached 1.0/m2. Status was good in 2012 by criteria based on the base years, providing a major change from the poor status in 2011.
Crane Key Bason	🔴	🟢	⇩	This location had favorable pink shrimp densities in 2012 by criteria based on the base years, providing a major change from the poor status in 2011.
Rankin Lake	🟡	🟡	⇩	This location has higher density than the previous four (maximum year, 2006, greater than 6.0/m2), but no improvement over neutral in 2012.
Whipray Basin	🟢	🟢	⇩	The highest annual density in any year was greater than 2.5 in 2006, and 2012, like 2011, had a higher density than other previous years (2007-2010) and achieved good status.
Johnson Key Basin	🟡	🔴	⇩	Density in 2012 was slightly less than 5/m2 in Johnson Key Basin, and status was classified as poor compared to the 2005-2009 period, when density in 2007 exceeded 20/m2.
Rabbit Key Basin	🟡	🟡	⇩	2012 status was neutral at this location, where the highest annual density, achieved in 2006, was about 10/m2.
Lower Southwest Mangrove Coast				
Regional Overview	🟡	🟡	⇩	Pink shrimp status in 2012 relative to the base years varied from location to location, but was not good at any location.
Lostmans River	🟢	🟡	⇧	Density greater than 8/m2 in 2011 was responsible for the upward but insignificant trend at Lostmans. Density declined to slightly less than 6 in 2012 and was within the neutral band.
Ponce De Leon Bay	🔴	🔴	⇩	Maximum annual density was about 3.5/m2 and occurred in 2008 at this location. Relatively poorer years immediately followed, with average monitored density in 2012 near zero.
Oyster Bay	🟡	🔴	⬇	Maximum annual density, slightly greater than 5/m2, occurred in 2006. The lowest annual density on record was in 2012.
Whitewater Bay	🟡	🟡	⇩	Maximum annual monitored density, ~9/m2, occurred in 2006. A moderate density of 4 occurred in 2012, as in 2011, and placed both years in the yellow zone.

*Trends are based on data from 2006-2012 and filled arrows, indicate significance at $p \leq 0.05$, unfilled arrows indicate not significant.

Wading Birds (Roseate Spoonbill) indicator

Summary Findings

Conditions in Northeastern Florida Bay (NEFB) appear to be improving while those in Northwestern Florida Bay (NWFB) are declining. Nesting success in NEFB has improved greatly in recent years, probably due to favorable climatic conditions and to communication between the author and his colleagues with operations mangers at the South Florida Water Management District during nesting season. Better communication has led to greater success by reducing unnecessary disruptions to flow patterns to the foraging grounds in NEFB. The chicks fledged over this 7 year period of high production are now coming into sexual maturity and may reverse the declining trend in nest numbers in NEFB. For the first time in over a decade, nest numbers increased from 87 in 2011 to 186 in 2012. In contrast, nest numbers in NWFB have declined to the point of having a yellow score (for the first time in over 25 years) starting in 2010. By 2011 they declined to being nearly scored in the red (140 nests counted and the threshold is 130). Furthermore, there were 3 consecutive years of failed nesting from 2010-2012. This has only happened once before (1996-1998) which happened during an exceptionally wet set of years. Since 1984, there have only been 8 years in which NWFB colonies have failed (including 1996-1998) prior to 2010. The cause for the decline in NWFB is not known but two highly speculative reasons can be put forth. One is that we have observed much more nest predation from crows over the last few years. This generally occurs in relatively close proximity to the city of Flamingo where crows have ample subsidies from human carelessness: crows regularly raid unattended food parcels and trash. This also has been observed to be more frequent in recent years. The second possibility is that the Homestead and East Cape canals have degraded the interior wetlands of Cape Sable (the primary foraging grounds of NWFB birds) to the point that they are no longer as productive in prey base fishes. These canals have since been plugged but a third canal (Raulerson Brothers Canal) has become an uncontrolled tidal canal continuing the degradation started by the Homestead and East Cape canals.

Key Findings

1. Nest numbers bay wide were critically low in 2011: only 87 nests were found when the target number is 1260 nests. This was the lowest number since Florida Bay became part of Everglades National Park in 1949. Although this finding was very alarming, there were some positive findings in 2012. There were 186 nests found throughout the Bay in 2012. It is believed that this increase is the result of chicks fledged successfully from 2005 to 2009 reaching sexual maturity and entering the breeding population.
2. Aerial surveys cannot be used to estimate spoonbill nest numbers but they can be used to determine the presence of spoonbill nesting at colonies that are otherwise inaccessible. Beginning in about 2009, spoonbills were observed nesting at the Madeira Hammock colony (this was the first time any wading birds nested at this colony for several decades). This colony is located approximately 3km north of Little Madeira Bay in NEFB and is very nearly impossible to access however biologist made two excursions to the colony in 2012. They documented 164 spoonbill nests and a high degree of success (although no numerical estimates of success were made). These birds were observed flying toward active foraging grounds in NEFB and will be considered part of the NEFB population going forward. Therefore the total nest count for Florida Bay in 2012 was 350 (as opposed to the 186 nests in Florida Bay proper) and 184 nests in NEFB. It should also be pointed out the 2010 and 2011 estimates 223 and 87 total nests respectively (41 and 3 in NEFB) were artificially low since the Madeira hammock colony was not surveyed. Even though this discovery is highly promising, spoonbill numbers both bay-wide and in NEFB are dangerously low (red stoplight for both).
3. Aerial surveys have detected the presence of spoonbills nesting in significant numbers in several of the Shark River Slough estuary colonies: a target for this indicator. These colonies are prohibitively difficult and costly to survey so no nesting estimates can be made.
4. Water management operations appear to be having a positive affect not only on NEFB spoonbills but also on their prey base. Thirteen percent of the total catch in 2011 was identified as freshwater species indicating higher prey production. Although this is still well below the target of 40%, it does improve the stoplight from red to yellow. The C-111 Spreader Canal West project will become operational in 2013 and will increase freshwater flow to Taylor Slough likely lowering salinity and increasing the relative abundance of freshwater species and overall prey productivity.

Photo by Brent Anderson

Wading Birds (Roseate Spoonbill) indicator

Location/ Performance Measure	WY 2009 LAST STATUS	WY 2012 CURRENT STATUS	TREND	CURRENT STATUS
Total Number of Nests				
Number of nests in FL Bay (5-year mean)	Yellow	Red	⇩	The target number of nests for the whole bay is 1,258. The 5-year mean number of nests for 2010-2012 was 336, 284, and 264 respectively or 30%, 23% and 21% of the target respectively. This indicates that the FL Bay spoonbill population is not recovering.
Nesting Location				
Nesting Location Overall	Yellow	Red	⇧	The overall score for nesting location is the lowest of the three component scores. In this case the number of nests in NE FL Bay is red therefore the overall score is red.
Number of nests in NE FL Bay (5-year mean)	Red	Red	⇧	The target number of nests is 688. The 5-year mean from 2010 to 2012 was 76, 51 and 67 respectively or 11%, 7% and 10% of the target indicating that the NE FL Bay spoonbill population is in jeopardy.
Number of nests in NW FL Bay (5-year mean)	Green	Yellow	⇩	The target number of nests in NW FL Bay is 210. The 5-year mean from 2010 to 2012 was 205, 166 and 140 respectively. The thresholds for yellow are from 130 to 210 nests.
Nesting Production and Success				
Overall Nest Production and Success	Yellow	Yellow	⇧	The overall score for nesting success is the lowest score of the four component metrics. From 2010-2012, there were at least two metrics that scored yellow but none were red.
Chick production in NE FL Bay	Yellow	Green	⇧	The 5-year mean of NE production was 1.31, 1.39 and 1.47 c/n[1] from 2010-2012. The target of 1.38 c/n (based on pre-SDCS conditions) was exceeded for the first time since 1993.
Chick production in NW FL Bay	Green	Yellow	⇩	5 yr mean nest production was 1.4, 1,3 and 1.2 c/n respectively from 2010-2012. Nest production of >1 c/n in NW FL Bay is being maintained (yellow) however productivity dropped below the target of 1.38 c/n in 2011 and 2012.
Percent successful years in NE FL Bay	Yellow	Yellow	⇧	Successful nesting (>1c/n) occurred in 5, 6 and 6 of the previous 10 yrs from 2010 - 2012 .
Percent successful years in NW FL Bay	Green	Yellow	⇩	In 2011, the number of successful yrs for the prior 10 yrs was 6 dropping below the green threshold of 7.
Prey Fish Community NE FL Bay				
Prey community structure in NE FL Bay	Red	○	⇧	In 2010 and 2011, freshwater species made up 3.6 and 13.7% of the catch. The target is 40% and the threshold for Red/yellow is >5% (i.e. 2011 was yellow). Data for 2012 not yet available.

The following assumption is being used for the 2-Year trend column: There will be no major changes in water management or significant natural events such as hurricanes from the date of the current status assessment

c/n (chicks per nest) is a unit of nest production that indicates the average number of chicks raised until they leave the nest per nesting attempt i.e. 1c/n indicates that on average a colony produced 1 chick for every nest that spoonbills initiated.

Key Environmental Legislation & Programs

- 1934 Everglades National Park is authorized and in 1947 ENP was established.
- 1968 Biscayne National Park is established as a national monument; expanded to a national park in 1980.
- 1972 Florida Water Resources Act establishes fundamental water policy for Florida, attempting to meet human needs and sustain natural systems; puts in place a comprehensive strategic program to preserve and restore the Everglades ecosystem.
- 1972 Florida Land Conservation Act authorizes the issuance of bonds to purchase environmentally endangered and recreation lands.
- 1974 Big Cypress National Preserve is created; legislation incorporates concerns of the Seminole Tribe and the Miccosukee Tribe for access to this preserve.
- 1982 Florida Indian Land Claims Settlement Act establishes a perpetual lease from the State of Florida for the Miccosukee Tribe's use and occupancy of 189,000 acres in WCA 3A, which is to be preserved in its natural state, and a 75,000-acre Federal Indian Reservation in the Everglades.
- 1983 Florida Governor's Save Our Everglades Program outlines a six-point plan for restoring and protecting the South Florida Ecosystem so that it functions more like it did in the early 1900s.
- 1984 Florida Warren Henderson Act authorizes the Department of Environmental Regulation (now the Department of Environmental Protection) to protect the state's wetlands and surface waters for public interest.
- 1985 Florida Local Government Comprehensive Planning and Land Development Regulation Act requires the development and coordination of local land use plans.
- 1987 Compact among the Seminole Tribe, the State of Florida, and the federal government is completed, clearly describing the Tribe's water supply and flood control rights; the goal of the compact is to harmonize state and federal water law.
- 1987 The Seminole Tribe transfers ownership to lands critical to the State of Florida's Everglades Construction Project in WCA 3.
- 1987 Florida Surface Water Improvement and Management Act requires the five Florida water management districts to develop plans to clean up and preserve Florida lakes, bays, estuaries, and rivers.
- 1988 Federal government sues the State of Florida, alleging that the state had failed to direct the SFWMD to require water quality permits for the discharge of water into the C&SF project canals.
- 1988 Land Settlement Act transfers acreage in WCA 3 and the Rotenberger tract to the State of Florida for Everglades restoration.
- 1988 Big Cypress National Preserve Addition Act expands the preserve and affirms the Seminole and Miccosukee Indian Tribes' customary use and occupancy rights in the preserve.
- 1989 Everglades National Park Expansion Act adds the East Everglades addition.
- 1990 Florida Preservation 2000 Act establishes a coordinated land acquisition program at $300 million per year for 10 years to protect the integrity of ecological systems and to provide multiple benefits, including the preservation of fish and wildlife habitat, recreation space, and water recharge areas.
- 1990 Florida Keys National Marine Sanctuary and Protection Act establishes a 2,800-square-nautical-mile marine sanctuary and authorizes a water quality protection program.
- 1991 Florida Everglades Protection Act provides the SFWMD with clear tools for ecosystem restoration.
- 1992 Federal and state parties enter into a consent decree on Everglades water quality issues in federal court. The Miccosukee Tribe signs a Memorandum of Agreement with the federal government which gives it the right to seek enforcement of the Settlement Agreement entered as a Consent Decree.
- 1992 WRDA 1992 authorizes the Kissimmee River Restoration Project and the C&SF Project Restudy; also provides for a fifty/fifty cost share between the federal government and the project sponsor, the SFWMD.
- 1993 Federal Task Force is established to coordinate ecosystem restoration efforts in south Florida.
- 1993 Seminole Tribe is approved by the USEPA to establish water quality standards for reservation lands in accordance with section 518 of the Clean Water Act.
- 1994 Florida Everglades Forever Act establishes and requires implementation of a comprehensive plan to restore significant portions of the South Florida Ecosystem through construction, research, and regulation.
- 1994 Governor's Commission for a Sustainable South Florida is established to make recommendations for achieving a healthy South Florida Ecosystem that can coexist with and mutually support a sustainable economy and quality communities.
- 1994 Miccosukee Tribe is approved by USEPA to establish water quality standards for reservation lands in accordance with section 518 of the Clean Water Act.
- 1996 WRDA 1996 authorizes a comprehensive review study for restoring the hydrology of south Florida; expands the Task Force to include tribal, state, and local governments; mandates extensive public involvement.
- 1996 Section 390 of the Farm Bill grants $200 million to conduct restoration activities in the South Florida Ecosystem.
- 1997 Seminole Tribe of Florida's water quality standards for the Big Cypress Reservation are approved by USEPA.

Key Environmental Legislation & Programs

- 1997 Seminole Tribe of Florida water quality standards for the Big 1997 Miccosukee Tribe water quality standards for the Tribe's Federal Indian Reservation establish a 10 ppb criterion for total phosphorus in tribal waters.
- 1997–2000, Annual Interior Appropriations Acts provide for land acquisition by the NPS and the FWS in the South Florida Ecosystem.
- 1998 Miccosukee Reserved Area Act clarifies the rights of the Miccosukee Tribe to live in ENP and sets aside 666.6 acres along the border for the tribe to govern in perpetuity.
- 1998 Seminole Tribe of Florida's water quality standards for the Brighton Reservation are approved by USEPA.
- 1998 Miccosukee Reserved Area Act directs the Miccosukee Tribe to establish water quality standards for the Miccosukee Reserved Area (inflow points to ENP).
- 1999 WRDA 1999 extends Critical Restoration Project authority until 2003; authorizes two pilot infrastructure projects proposed in the CERP.
- 1999 Governor's Commission for the Everglades is established to make recommendations on issues relating to Everglades protection and restoration, environmental justice, and water resource protection, among other issues.
- 1999 Miccosukee Tribe water quality standards are established for the Miccosukee Reserved Area on the border of ENP and they are approved by USEPA.
- 1999 Florida Forever Act improves and continues the coordinated land acquisition program initiated by the Florida Preservation 2000 Act of 1990; commits $300 million per year for 10 years.
- 1999 Florida State Legislature passes Chapter 99-143, Laws of Florida, authorizing the SFWMD to be the local sponsor for Everglades restoration projects.
- 2000 Florida Everglades Restoration Investment Act creates a funding and accountability plan to help implement the CERP; commits an estimated $2 billion in state funding to Everglades restoration over 10 years.
- 2000 Florida Legislature passes the Lake Okeechobee Protection Act, a phased, comprehensive program designed to restore and protect the lake.
- 2000 WRDA 2000 includes authorizations for 10 initial Everglades infrastructure projects, 4 pilot projects, and an adaptive management and monitoring program; also grants programmatic authority for projects with immediate and substantial restoration benefits; establishes a 50-percent federal cost share for implementation of CERP and for operation and maintenance.
- 2001 Numeric water quality criterion of 10 ppb geometric mean is proposed by FDEP in the Everglades Protection Area.
- 2001 The Water Resources Advisory Commission (WRAC) is established by the SFWMD Governing Board as a representative public interest group to advise them on all aspects of water resource protection in south Florida.
- 2002 Task Force designates the WRAC as an advisory body to the Task Force on ecosystem restoration activities.
- 2003 Senate Bill 626 amends the Everglades Forever Act.
- 2003 Science Coordination Group is established with direct reporting responsibilities to the Task Force.
- 2003 Combined Structural and Operational Plan Advisory Team is established with direct reporting responsibilities to the Task Force.
- 2003 Final USACE Programmatic Regulations are issued.
- 2003 SFWMD develops the Long-Term Plan for achieving Everglades water quality goals.
- 2003 Environmental Regulation Commission adopts phosphorus rule for the Everglades Protection Area.
- 2003 State of Florida initiates early start on Southern Golden Gate Estates Hydrologic Restoration Project.
- 2004 Indian River Lagoon-South CERP project is approved by State of Florida under Section 373.1501.F.S.
- 2004 State of Florida unveils plan to accelerate restoration of America's Everglades (Acceler8).
- 2005 USEPA approves State of Florida's phosphorus rule for the Everglades Protection Area.
- 2005 The State of Florida's Water Resource Protection and Sustainability Program requires a higher level of water supply planning and coordination between the water management districts and local governments.
- 2005 State of Florida announces the Lake Okeechobee Estuary Recovery Plan to help restore the ecological health of Lake Okeechobee and the St. Lucie and Caloosahatchee Estuaries.
- 2007 Water Resources Development Act authorizes three projects for construction: Picayune Strand Restoration, Site 1 Impoundment (Fran Reich Preserve), and Indian River Lagoon – South.
- 2007 State of Florida expands the Lake Okeechobee Protection Act to include protection and restoration of the interconnected Kissimmee, Lake Okeechobee, Caloosahatchee, and St. Lucie watersheds (Northern Everglades and Estuaries Protection Program).
- 2009 Omnibus Appropriations Act (directs preparation of Tamiami Trail Study to increase sheetflow).

Key Environmental Legislation & Programs, continued

- 2009 The American Recovery and Reinvestment Act (ARRA) (P.L. 111 -5) provided $94 million from USACE, $2.2 million from USFWS and $15.9 million from NPS for the south Florida restoration program. 2010 Florida Legislature allocates $50,000,000 to Everglades Restoration.
- 2010 Florida Legislature creates Chapter 373 Part VII entitled Water Supply Policy, Planning, Production, and Funding.
- 2010 State legislation provides that land interests held by the SFWMD are not subject to extinguishment by the Marketable Record Title Act (HB435).
- 2010 USDA announces $89 million in financial assistance for a special Florida WRP project in the Northern Everglades watershed that brings conservation easements to almost 26,000 acres of critical wetland habitat.
- 2011 Florida Legislature allocates $29,955,000 to Everglades Restoration.
- 2011 Florida Legislature is required to annually review the preliminary budget and authorized millage rate for each water management district and set the amount of revenue a district may raise through its ad valorem tax authority; Legislative Budget Commission line item veto authority is allowed in addition to Governor's veto authority.(SB2142)
- 2011 Central Everglades Planning Project initiated.
- 2012 Consolidated Appropriations Act (Public Law 112-74) authorized construction of the Tamiami Trail: Next Steps Project consisting of four bridges with a combined length of 5.5 miles.
- 2012 Florida Legislature allocates $30,000,000 to Everglades Restoration.
- 2012 Miami-Dade Lake Belt Mitigation Plan: State amends that fees collected under the Lake Belt statute from "water treatment plant upgrades" be redirected to the SFWMD; amendment provides additional money into the Lake Belt Mitigation Trust Fund for seepage mitigation projects.
- 2012 State legislation encourages agricultural public-private partnerships to accomplish water storage and water quality improvements (HB1389).
- 2012 Florida Legislature removes revenue caps and restores Governor independent line item veto authority for water management district budgets (SB1986).
- 2012 USFWS lists the Burmese python and several other large constrictor snakes as injurious species under the Lacey Act.

Photo by Bill Perrry

Additional Ecosystem-Wide Efforts

In addition to the programs and projects previously discussed, there are additional restoration efforts underway, some of which are highlighted below.

Comprehensive Everglades Restoration Plan Activities

The single largest component of the Everglades restoration initiative is the CERP. Authorized by Congress in 2000, this plan is vital to *getting the water right* in the natural system. Implementation of the CERP will provide benefits to the ecosystem's habitats, improve urban and agricultural water supply, and maintain existing levels of flood protection. As outlined in this report, to date three CERP projects are under construction, and four projects are ready for authorization. At the October 27, 2011 meeting of the Task Force, the Corps announced that the next phase of CERP planning would focus on restoring the flow of clean water through the Central Everglades. At the same time, the Corps approved the CEPP as one of seven projects in the country to be a pilot project for reforming the existing federal process for selecting and approving a project in a shorter time period. CEPP is expected to deliver an initial suite of projects in the central Everglades ready for Congressional authorization as part of the CERP. New science and data will be incorporated into the review, as required by WRDA. Among other factors for consideration is the improved understanding of the importance of Lake Okeechobee to the Everglades system as well as the growing consensus that the ecosystem was historically wetter than originally thought. The goal of CEPP is to restore the "Heart of the Everglades". For further details on the CERP, please refer to the CERP 2010 Report to Congress.

Independent Scientific Review

In accordance with WRDA 2000, the National Research Council (NRC) Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) was convened to conduct biennial reviews of the CERP. CISRERP is composed of a diverse team of internationally recognized experts in ecosystem restoration science.
Although the biennial reviews have recognized the development of good science for the restoration effort, the committee has recommended the utilization of Incremental Adaptive Restoration (IAR) (2006) and the expeditious implementation of projects that have the most potential for contributing to natural system restoration (2008). The findings from the Committee's fourth biennial review were released in June 2012 and will be reviewed and incorporated into the restoration effort. Their report reaffirms the significant restoration progress that has been made, but also states that much more needs to be done, including renewing the focus on restoring the flow of water to the central Everglades, better integrating water quality and water quantity components, and increasing the overall pace of restoration.

Climate Change Coordination

Historic climate variability is a complex interaction of historic daily, monthly, annual, and longer period variations in global weather patterns and ocean currents. Understanding the implications of historic climate variability combined with the potential impacts of ongoing global warming is critical to implementing meaningful restoration and long term sustainability of the Everglades ecosystem. Projected impacts of global warming include acceleration of the historic rate of sea level rise and related saltwater intrusion, plus changes in temperatures, historic hydrologic patterns, and other related concerns. South Florida, including the Everglades ecosystem, is sensitive to these projected changes because of the exceptionally flat terrain, extremely porous geology, broad areas of peat soils, and the susceptibility of native plants and animals to changes in temperature, humidity, evapotranspiration, and precipitation (all aspects of the hydrologic cycle). A workshop at the 2008 Greater Everglades Ecosystem Restoration conference concluded that Everglades restoration will likely be an important aspect of our adaptation response to climate change. Addressing these challenges and opportunities requires a coordinated intergovernmental approach for development of regional climate change projections and advanced tools to evaluate water resources adaptation strategies for both natural and developed area concerns. Since 2008, there have been several workshops organized by state and federal agencies with active participation from academic institutions.

<u>Research, Partnerships, and Initiatives</u>

A newly created organization called Florida Climate Institutes with leadership from Florida State University and the University of Florida

is being expanded to include several other universities.

The SFWMD has published two reports on the state of science applicable to south Florida (http://my.sfwmd.gov/portal/pls/portal/portal_apps.repository_lib_pkg.repository_browse?p_keywords=climatechange&p_thumbnails=no). This work identified several weaknesses of regional climate models and suggested improvements that may be needed before they can be used to evaluate regional restoration projects.

Florida Atlantic University's Center for Environmental Studies (CES), with active participation from the U.S. Geological Survey, Florida Sea Grant, and other local, state, and federal agencies has organized several workshops/summits to review the state of science and coordinate response activities among agencies. These include:
(1) Sea Level Rise Summit (http://www.ces.fau.edu/SLR2012/) and
(2) Hydrology of the Everglades in the context of climate change (March, 2012). CES is continuing to engage ecologists and will have a follow-up workshop in Fall 2012.

Southeast Florida Climate Compact

The Monroe, Miami-Dade, Broward, and Palm Beach counties which cover the area from Key West to Palm Beach have formed the Southeast Florida Climate Compact to coordinate planning and actions related to adaptation for sea level rise and other climate change impacts (http://www.southeastfloridaclimatecompact.org/). This area has roughly six million residents, approximately one-third of the population of Florida. The Climate Compact has been very active in the region and has published several technical reports and an action plan. Further participation and technical assistance from the state and federal agencies in the compact effort is needed.

In view of the evolving science on the topics of climate change and sea level rise, it is extremely important to continue collaboration and monitoring of the latest developments regarding future outlook. In addition, the local, state, and federal agencies need to collaborate on the development tools that will be needed to determined exact vulnerabilities, and adaptation strategies. The issue of aging infrastructure and the retrofitting or replacement in view of past sea level rise on the coastal regions require immediate attention. The science of ecological impacts and their implications for such important projects as CEPP need to be prioritized and pursued. Establishment of an inter-agency climate change and sea level rise task force may be warranted.

Southeast Florida Regional Climate Change Action Plan

In December 2011, the Southeast Florida Regional Climate Compact hosted the 3rd Annual Climate Leadership Summit in Key Largo. Attended by over 250 participants -- including representatives from federal agencies, emergency and water management experts, transportation planners, universities and colleges, and private sector partners -- the Summit culminated in the release of the region's first-ever Draft Regional Climate Action Plan.

The plan provides a framework for regional-scale action to reduce greenhouse gas emissions and prepare southeast Florida for the impacts of global climate change. It includes 100 recommendations on steps to take in the next five years to further reduce emissions and protect our built and natural environments from things like sea level rise, increased storm intensity and saltwater intrusion.

NOAA Coastal and Ocean Climate Applications (COCA)

Integrated MODels for Evaluating Climate Change, Population Growth, and Water Management effects on south Florida coastal marine and estuarine ecosystems (iMODEC). The University of Miami RSMAS received a $300,000 award of funding from the 2012 NOAA COCA program for collaboration with the Miami NOAA Laboratories Atlantic Oceanographic and Meteorological Lab and Southeast Fisheries Science Center to predict and compare the state of south Florida coastal ecosystems under alternative joint climate change – CERP scenarios. The predictions will be produced by existing hydrodynamic, biophysical, and trophic models of Florida Bay and the lower southwest Florida coast. The models will be further developed and refined for this effort.

The intergovernmental Task Force is the only forum that provides strategic coordination and a system-wide perspective to guide the separate restoration efforts being planned and implemented in south Florida.

The duties of the Task Force are to:

- Coordinate the development of consistent policies, strategies, plans, programs, projects, activities, and priorities addressing the restoration, preservation, and protection of the South Florida Ecosystem;
- Exchange information regarding programs, projects and activities of the agencies and entities represented on the Task Force to promote ecosystem restoration and maintenance;
- Facilitate the resolution of interagency and intergovernmental conflicts associated with the restoration of the South Florida Ecosystem among the agencies and entities represented on the Task Force;
- Coordinate scientific and other research associated with the restoration of the South Florida Ecosystem;
- Provide assistance and support to agencies and entities represented on the Task Force in their restoration activities.

Organization

Four sovereign entities (federal, state, and two tribes) are represented on the Task Force. Fourteen members sit on the Task Force itself, representing seven federal departments, three state agencies/offices, two American Indian tribes, and two local governments.

The Florida-based Working Group and the SCG have been established to assist the Task Force with its responsibilities. Their members include additional federal, state, and local agencies. The Task Force and Working Group establish regional and issue-based teams as needed to address pressing or area-based restoration concerns.

Currently, the SFWMD's WRAC serves as an advisory body to the Task Force.

Intergovernmental Coordination

Coordination Meetings

The Task Force and its subgroups conduct meetings for the purpose of intergovernmental coordination. The Task Force meets regularly to report on progress, facilitate consensus, and identify opportunities for improvement. The Task Force includes public participation in all its coordination activities. In addition to its regular meetings, the Task Force embarked on a workshop process to enhance public engagement in the CEPP.

Photo by Jose Cabaleiro

Seminole Tribe of Florida Minority View

In consideration of the 2012 South Florida Ecosystem Restoration Task Force Strategy and Biennial Report, the Seminole Tribe of Florida seeks to amend the report with the following note. As background, over the past six months, the Corps explained that CEPP projects would not be available to contribute to resolving challenging hydrology problems on the Big Cypress Reservation because the western basins have never been appropriately modeled to allow effective planning. The Tribe once again requests that the western basins be monitored and modeled. The Tribe seeks a response in the Task Force's strategy for how to address the western basins in the restoration of the South Florida Ecosystem.

The Seminole Tribe of Florida is committed to restoring the South Florida Ecosystem. The identity of the Seminole Tribe of Florida is tied to the lands and waters of South Florida, our ancestral home. Our elders believe that the health of the Tribe and our members directly relates to the health of our ecosystem. We focus on managing our lands within our reservation boundaries; we also watch the land and water that surrounds this boundary because our history is not limited to the lines on current day maps. Our future will be controlled by a large extent by the decisions made regarding land use and water control all around our reservation. So we look to our region, including lands in the western basins, to see how the federal, state, and local governments are providing resources and planning for a healthy future. And what we now see causes great distress.

The Seminole Tribe has been actively engaged in the South Florida Ecosystem Restoration effort for nearly 20 years. We have supported this effort technically and politically through all of these years. More specifically, we are constructing in full partnership with the US Army Corps of Engineers (Corps) an extensive water control system on the Big Cypress Reservation. This project is important to us and to our region and we appreciate the Corps' work and federal funding. But focusing solely on the land and water within our Reservation's legal boundaries is short-sighted. And this has been our position for

nearly two decades. We have urged over and over again through all the planning efforts, going back to the Restudy, basis for CERP, to include the western basins in the Central Everglades system in the monitoring, modeling, data gathering, design, planning, and project implementation. We have been informed that waters in the western basins that impact the Central Everglades Planning Project (CEPP) are not included in the scope of CEPP because the monitoring, data gathering, and modeling have still not been done in this region, despite our repeated requests to do so for over 14 years. We applaud the Corps' drive to complete the CEPP planning process in 18 months, but we remain very concerned by the long-standing inattention to this region.

Apart from the fact that we, a valued partner in Everglades Restoration by all accounts, have been effectively ignored in our repeated requests for monitoring, modeling, and planning in this region, we note that the federal government has an obligation through its trust responsibilities to restore the northwest corner of WCA 3A, where the Seminole Tribe of Florida retains hunting and fishing rights, at a minimum. Beyond CEPP, how will the restoration planning address the Central Everglades north and west of the redline in the current CEPP models?

Coordination Highlights

Central Everglades Planning Project (CEPP). In October 2011, the Task Force endorsed a state-federal initiative to speed up planning for key restoration projects in the heart of the Everglades. Public participation is a major component of the CEPP. The accelerated schedule poses new challenges to keeping the public engaged in a meaningful way. Therefore the Task Force charged the Working Group to develop and host a series of workshops to provide not only opportunities for input, but also for discussion between the public and implementing agencies throughout the CEPP process. As of June 2012, the Task Force's Working Group has sponsored 8 public workshops and the SCG has sponsored a two-day science workshop, to receive input from the public and keep them informed and engaged as active participants. The workshops are well attended and are webcasted whenever possible. The workshop model has been very successful and has received widespread praise from the public, agency staff, and decision makers.
The Workshops have utilized a number of interactive tools to help facilitate understanding and discussion, including Google Earth flyovers, 3-D imaging, and opportunities for real-time public comment via a live email address.

In addition, a CEPP portal was created on the Task Force's website at www.sfrestore.org/cepp/cepp.html where all the workshop materials, including videos and presentations, can be found. Additional information can also be found at www.evergladesplan.org.

Coordination Reports

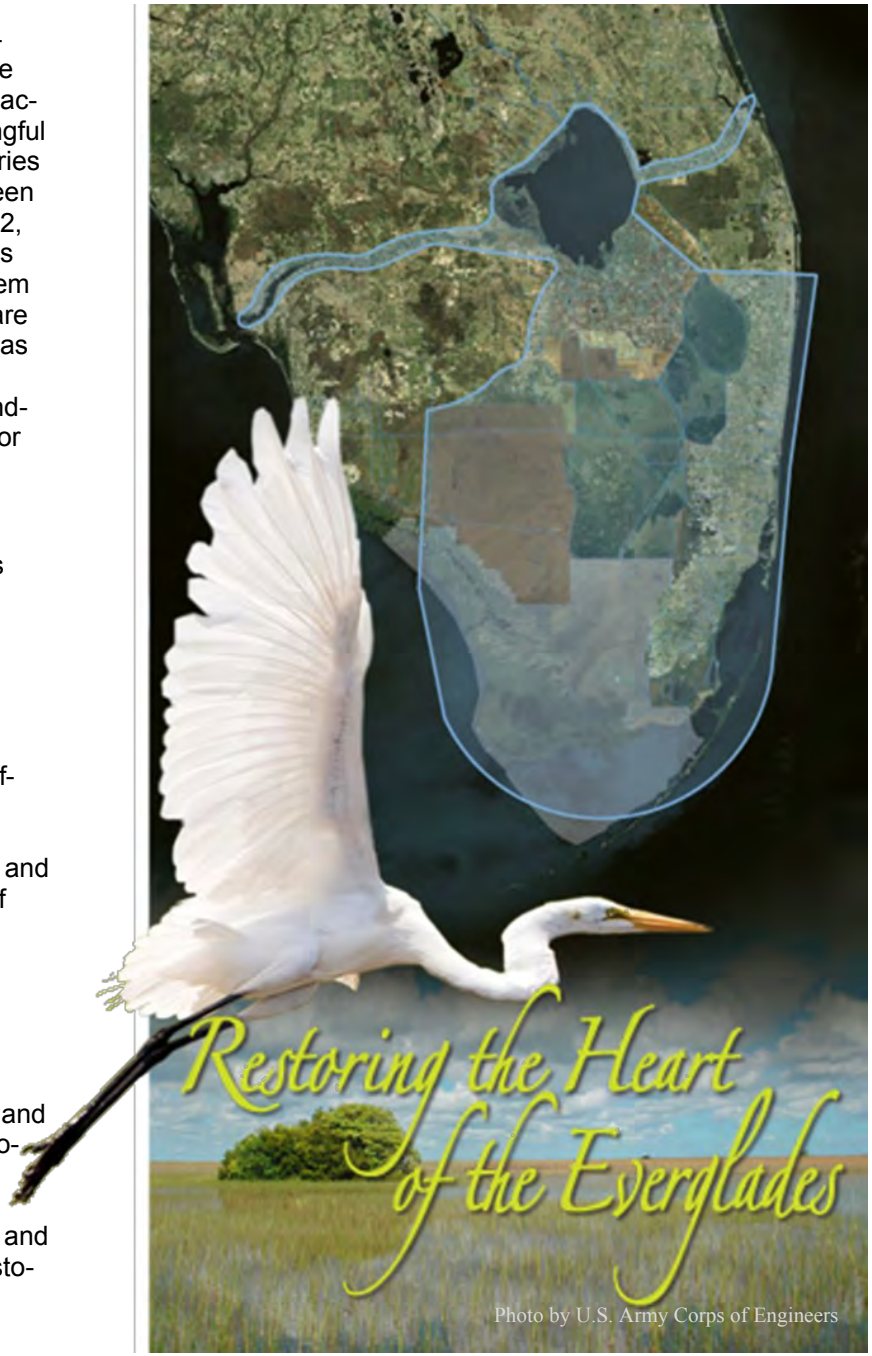
The Task Force documents the major aspects of its intergovernmental coordination efforts through the following reports:

Strategy and Biennial Report. Identifies the Task Force's strategic goals, subgoals, and measurable objectives and outlines how progress will be measured through a suite of system-wide ecological indicators. Summarizes restoration activities, progress made toward the strategic goals, and status of the system-wide ecological indicators.

Integrated Financial Plan. Provides individual project sheets for each of the federal, state, tribal, and local restoration projects.

Land Conservation Strategy (LCS). Provides a broad picture of all land acquisition and conservation initiatives that contribute to the restoration. In 2012 the LCS was incorporated into the Strategy and Biennial Report.

Plan for Coordinating Science. Documents the framework for coordinating science and communicates strategic level science priorities and system-wide assessments for restoration success.



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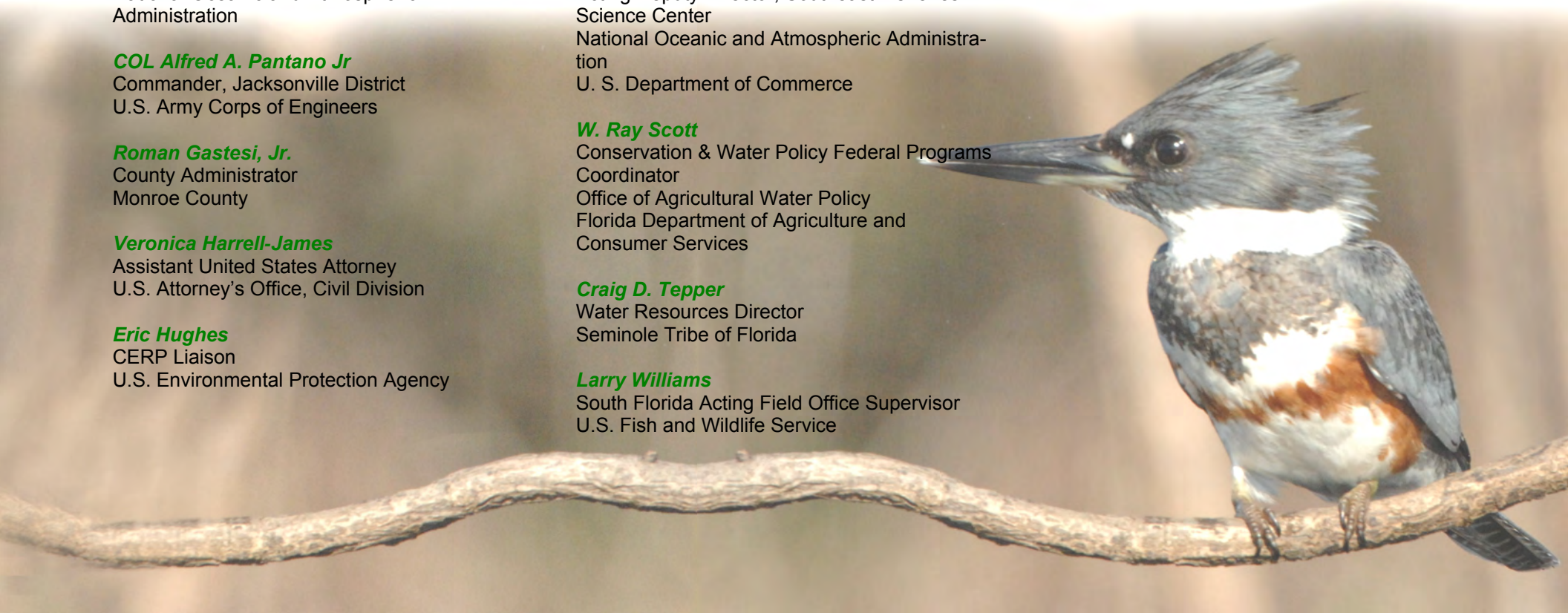

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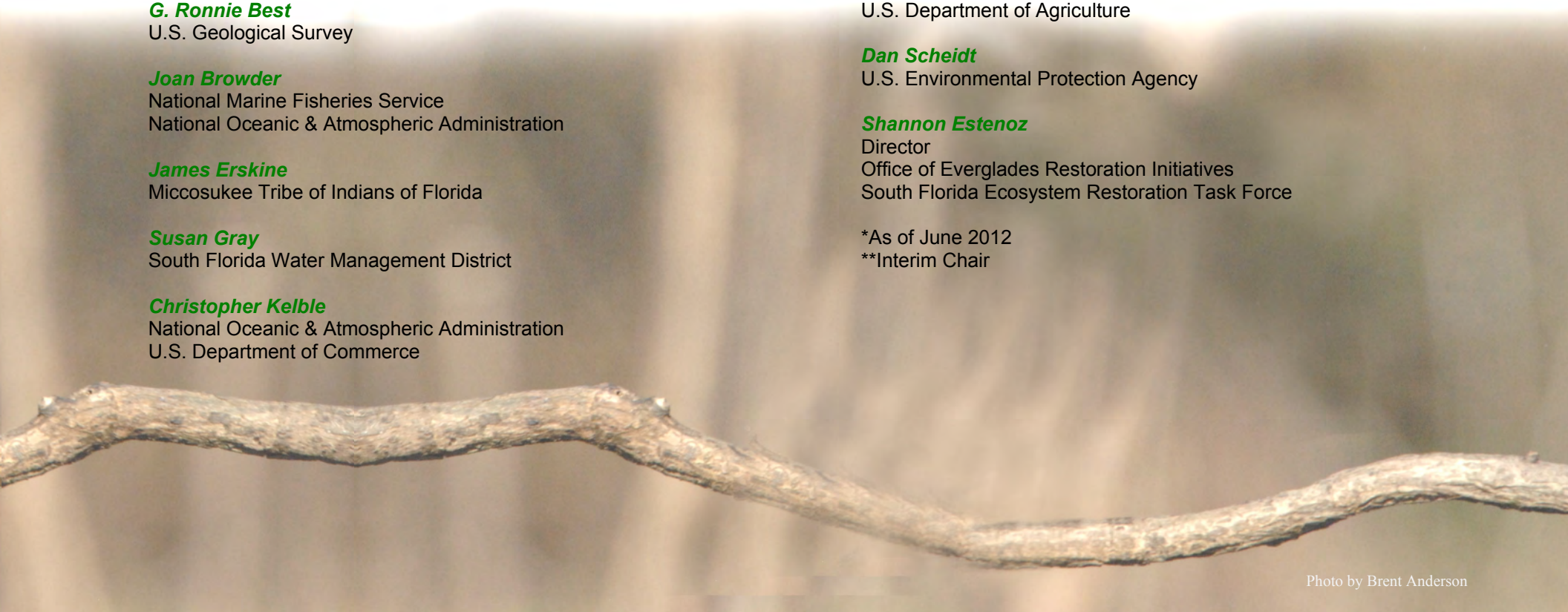

Photo by Brent Anderson

Abbreviations and Acronyms

µg/L	Micrograms per liter
AD	Amended Determination
ARM	Arthur R. Marshall
ARRA	American Recovery and Reinvestment Act
ARS	Agricultural Research Service
ASR	Aquifer Storage and Recovery
AWS	Alternative Water Supply
BMAP	Basin Management Action Plan
BMB	Barnes, Manatee, and Blackwater Sounds
BMP	Best Management Practice
BNP	Biscayne National Park
C/N	Chicks per nest
C&SF	Central and Southern Florida
C-#	Canal
c/n	Chicks per nest
CBB	Central Biscayne Bay
CEM	Conceptual Ecological Model
CES	Center for Environmental Studies
CEPP	Central Everglades Planning Project
CERP	Comprehensive Everglades Restoration Plan
CFWI	Central Florida Water Initiative
CISMA	Cooperative Invasive Species Management Area
CISRERP	Committee on Independent Scientific Review of Everglades Restoration Progress
COCA	Coastal and Ocean Climate Applications
CREW	Corkscrew Regional Ecosystem Watershed
CSCOR	Center for Sponsored Coastal Ocean Research
DEIS	Draft Environmental Impact Statement
DOI	U.S. Department of the Interior
DOT	Florida Department of Transportation
DSM	Dam Safety Modification
E&SF	Everglades and South Florida
EA	Environmental Assessment
EAA	Everglades Agricultural Area
EDRR	Early Detection/Rapid Response
EIRAMP	Everglades Invasive Reptile and Amphibian Monitoring Project
EMC	Event mean concentration
ENP	Everglades National Park
ENSO	El Niño-Southern Oscillation
EPA	Everglades Protection Area
EPOC	Emerging Pollutant of Concern
EQIP	Environmental Quality Incentive Program
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FKNMS	Florida Keys National Marine Sanctuary
FIAN	Fish and Invertebrate Assessment Network
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish and Wildlife Service
FY	Fiscal Year
GCSSF	Governor's Commission for a Sustainable South Florida
HHD	Herbert Hoover Dike
IAR	Incremental Adaptive Restoration
iMODEC	Integrated MODels for Evaluating Climate Change
ICEM	Integrated Conceptual Ecological Model
KB	Kissimmee Basin
L-#	Levee
LCS	Land Conservation Strategy
LEC	Lower East Coast
LNWR	Loxahatchee National Wildlife Refuge
LOPA	Lake Okeechobee Protection Act
LOST	Lake Okeechobee Scenic Trail
LWC	Lower West Coast
MAP	Monitoring and Assessment Plan
MARES	Marine and Estuarine Goal Setting for South Florida
MFL	Minimum Flows and Levels
mgd	Millions of gallons per day
Mod Waters	Modified Water Deliveries to Everglades National Park
MRP	Master Recreation Plan
MRR	Major Rehabilitation Report
MSRP	South Florida Multi-Species Recovery Plan
MTZ	Mangrove Transition Zone
NBB	North Biscayne Bay
NCFB	North-central Florida Bay
NEFB	Northeast Florida Bay
NEEPP	Northern Everglades and Estuaries Protection Program
NFWF	National Fish and Wildlife Foundation
NGO	Non-governmental Organization
NRC	National Research Council
NRCS	Natural Resources Conservation Service
NPS	National Park Service
NWFB	Northwest Florida Bay
OMB	Office of Management and Budget
OGT	Office of Greenways and Trails
P	Phosphorus
ppb	Parts per billion
PIR	Project Implementation Report
QEI	Quantitative Ecosystem Indicators
RAP	Reasonable Assurance Plans
RECOVER	Restoration Coordination and Verification Team
RNA	Research Natural Area
ROC	Reptile of Concern
RWPP	River Watershed Protection Plan
RWSP	Regional Water Supply Plan
SAV	Submersed Aquatic Vegetation
SBB	South Biscayne Bay
SCG	Science Coordination Group
SCS	Southern Coastal System
SDCS	South Dade Conveyance System
SEIS	Supplemental Environmental Impact Statement
SFB	South Florida Bay
SFER	South Florida Environmental Report
SFWMD	South Florida Water Management District
SSR	System Status Report
STA	Stormwater Treatment Area
SWIM	Surface Water Improvement and Management
SWFS	Southwest Florida Shelf
Task Force	South Florida Ecosystem Restoration Task Force
TDR	Technical Data Report
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TP	Total Phosphorus
UF/IFAS	University of Florida/Institute of Food and Agricultural Sciences
UEC	Upper East Coast
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
WCA	Water Conservation Area
WFB	West Florida Bay
WHIP	Wildlife Habitat Incentives Program
WOD	Works of the District
WQPP	Water Quality Protection Program
WRAC	Water Resources Advisory Commission
WRDA	Water Resources Development Act
WRP	Wetland Reserve Program

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