



SOUTH FLORIDA ECOSYSTEM RESTORATION
TASK FORCE

Volume 1

COORDINATING SUCCESS 20046-8:
Strategy for Restoration of the South Florida Ecosystem

&

TRACKING SUCCESS:
Biennial Report of the South Florida Ecosystem Restoration Task Force for
July 20046 - June 20086

To the U.S. Congress, Florida Legislature, Seminole Tribe of Florida, and
Miccosukee Tribe of Indians of Florida

*This is Volume 1 of a two-volume report.
Volume 1 contains the coordination strategy and biennial report of
the South Florida Ecosystem Restoration Task Force.*

*Volume 2 contains the Integrated Financial Plan,
including descriptions of all the individual projects that
participating entities have identified as
supporting ecosystem restoration.*

*Both volumes combine information from federal, state, tribal, and
local agencies and therefore do not strictly follow any single agency's format.*

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September 3, 2008*

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GLOSSARY

Acre-foot: The volume of water, ~~43,560 cubic feet~~, that will cover an area of one acre to a depth of one foot (43,560 cubic feet).

Adaptive management: A process for learning and incorporating new information into the planning and evaluation phases of the restoration program. This process ensures that the scientific information produced for this effort is converted into products that are continuously used in management decision-making.

Benthic: Bottom dwelling, as in organisms.

Bentonite: Absorbent aluminum silicate clay used in various adhesives, cements, and ceramic fillers.

Best management practices (BMPs): Agricultural and other industrial management activities designed to achieve an important goal, such as reducing farm runoff or optimizing water use and water quality.

Blueways: Routes on streams, rivers, lakes or other waterbodies to allow recreational access and discovery of natural and urban (including retail) waterfront areas.

Cut-Off Wall: A below ground barrier to sub-surface fluid migration often for the purpose of containing contaminants on-site.

Decompartmentalization: Modifications to impediments of sheetflow.

Economic equity: The fair treatment of all persons regardless of color, creed, or belief in aspects of opportunities and/or diseconomies regarding economic or environmental activities.

Ecosystem: A community of organisms, including humans, interacting with one another and the environment in which they live.

El niño/la niña: Warming and cooling patterns in the Pacific Ocean that affect the earth's atmosphere.

Environmental justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Eutrophication: The natural or cultural enrichment of an aquatic environment with plant nutrients leading to rapid ecological changes and high productivity.

Exotic or invasive species: Exotic species are kinds of plants and animals not native to an area and found beyond their natural range. Exotic plants are introduced by people intentionally for social and economic reasons, and as accidental consequences of travel and commerce. Often such species are highly invasive and dominating to native forms.

Goal: Something to be achieved. Goals can be established for outcomes (results) or outputs (efforts).

Greenways: Constructed or redeveloped path for pedestrian, bicycling traffic, or multiple transportation or retail uses, to foster access and connect humans to their natural and constructed environments.

Hectare: a unit of surface area equal to 10,000 square meters; equivalent to 2.471 acres.

Hydrology: The study of the properties, distribution, and effects of water. When used in the Task Force strategy and biennial reports, the term refers to the quantity, timing, and distribution of water in the ecosystem.

Hydropattern: Water depth and duration, along with the quantity, timing, and distribution of surface water to a specific area; critical for maintaining various ecological communities in wetlands.

Hydroperiod: Depth and duration of inundation in a particular wetland area.

Indicator: A metric that is designed to inform us easily and quickly about the conditions over time and space of an ecosystem.

Lacustrine: Of or pertaining to a lake.

Minimum flows and levels: Florida statute requires water management districts to set water levels for each major body of water “at which further withdrawals would be significantly harmful to the water resources or ecology of the area.”

Nonpoint source pollution: Comes from many diffuse sources; caused by rainfall (or snowmelt in colder climates) moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water.

Nonstructural flood protection: Use of operation schedules, redirection of flows, or other operating strategies to manage water other than building new or modifying existing infrastructure.

Objective: A goal expressed in specific, directly quantifiable measurable terms.

Outcome: An end result. When used in the Task Force strategy and biennial reports, a quality of the restored South Florida Ecosystem.

Output: Levels of work and effort. When used in the Task Force strategy and biennial reports, the products, activities, or services produced by a project or program.

Periphyton: The biological community of microscopic plants and animals attached to surfaces in aquatic environments. Algae are the primary component in these assemblages and periphyton can be very important in aquatic food webs, such as those of the Everglades.

Performance measure: A desired result stated in quantifiable measurable terms to allow for an assessment of how well the desired result (outcome) has been achieved.

Piping: Internal erosion that can occur when water seeps through a dike and transports and removes soil particles.

Point source: Any discernible, confined discrete conveyance from which pollutants are or may be discharged which are regulated by federal or state issued National Pollutant Discharge Elimination System ("NPDES") permits.

Restoration: When used in the Task Force strategy and biennial reports, the recovery of a natural system’s vitality and biological and hydrological integrity to the extent that the health and ecological functions are self-sustaining over time.

Seiches: Waves on the surface of a lake or other landlocked water body caused by atmospheric or seismic disturbances.

Sheetflow: Water movement as a broad front with shallow uniform depth.

South Florida Ecosystem: An area consisting of the lands and waters within the boundaries of the South Florida Water Management District and the Multi-Species Recovery Plan, including the Kissimmee Basin, Lake Okeechobee, Everglades, the Florida Keys, and the contiguous nearshore coastal waters of south Florida.

Stormwater: Surface water runoff resulting from rainfall that does not percolate into the ground or evaporate.

Subsidence: The lowering of the soil level caused by shrinkage of organic layers. This shrinkage is due to desiccation, consolidation, and biological oxidation.

Sustainability: The state of having met the needs of the present without endangering the ability of future generations to be able to meet their own needs.

Vision: An aspiration of future conditions. In this case, the results that the Task Force members intend to achieve in terms of ecosystem health and quality of life for south Florida residents and visitors.

Weir: A small overflow-type dam commonly used to raise the level of a river or stream.

Wetlands: Areas that are inundated or saturated by surface water or groundwater at a frequency

and duration sufficient to support a prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction.

ACRONYMS

AM	Adaptive Management	IPCC	Intergovernmental Panel on Climate Change
ASR	Aquifer storage and recovery	IRL	Indian River Lagoon
AT	Assessment Team	ISR	Independent scientific review
AFB	Alternative Formulation Briefing	ITR	Independent technical review
AWS	Alternative Water Supply	KBMOS	Kissimmee Basin Modeling and Operation Study
BMP	Best management practices	KRR	Kissimmee River Restoration
C&SF	Central and Southern Florida Project	LATT	Land Acquisition Task Team
CERP	Comprehensive Everglades Restoration Plan	LILA	Loxahatchee Impoundment Landscape Assessment
CFS	Cubic foot per second	LIRS	Lake Istokpoga Regulation Schedule
CISRERP	Committee on Independent Scientific Review of Everglades Restoration Progress	LO	Lake Okeechobee
CREW	Corkscrew Regional Ecosystem Watershed	LOER	Lake Okeechobee and Estuary Recovery
CROGEE	Committee on Restoration of the Greater Everglades Ecosystem	LOFT	Lake Okeechobee Fast Track
CSOP	Combined Structural and Operational Plan	LOPA	Lake Okeechobee Protection Act
DACS	Florida Department of Agriculture and Consumer Services	LOPP	Lake Okeechobee Protection Plan
DCA	Florida Department of Community Affairs	LOST	Lake Okeechobee Scenic Trail
DEP	Florida Department of Environmental Protection	MAP	Monitoring and Assessment Plan
DOI	U.S. Department of the Interior	MATOC	Multiple award task order contractors
DOT	Florida Department of Transportation	µ/L	Micrograms per liter
DRI	Development of Regional Impact	MGD	Million gallons per day
EA	Environmental Assessment	MERIT	Multi-Species/Ecosystem Recovery Implementation Team
EAA	Everglades Agricultural Area	MFL	Minimum flows and levels
EAR	Evaluation and Appraisal Report	MISP	Master Implementation Sequencing Plan
EFA	Everglades Forever Act	MPMP	Master Program Management Plan
EIS	Environmental Impact Statement	MPS	Manatee Protection System
ENP	Everglades National Park	MRP	Master Recreation Plan
EPA	Everglades Protection Area	MRR	Major Rehabilitation Report
EPR	External Peer Review	MSRP	Multi-Species Recovery Plan
ERC	Florida Environmental Regulation Commission	MT	Metric ton
ERN	Everglades Radio Network	MWD	Modified Water Deliveries to Everglades National Park Project
ERP	Environmental Resource Permit	NAS	National Academy of Science
FCAT	Florida Comprehensive Assessment Test	NEPA	National Environmental Policy Act
FEMA	Federal Emergency Management Agency	NEWTT	Noxious Exotic Weed Task Team
FIATT	Florida Invasive Animal Task Team	NGVD	National Geodetic Vertical Datum
FKNMS	Florida Keys National Marine Sanctuary	NMFS	National Marine Fisheries Service
FRPP	Farm and Ranch Land Protection Program	NOAA	National Oceanic and Atmospheric Administration
FWC	Florida Fish and Wildlife Conservation Commission	NPDES	National Pollutant Discharge Elimination System
FWS	U.S. Fish and Wildlife Service	NPS	National Park Service
GAO	U.S. Government Accountability Office	NRC	National Research Council
GCSSF	Governor's Commission for a Sustainable South Florida	NRCS	Natural Resources Conservation Service
GDM	General Design Memorandum	NWR	National Wildlife Refuge
GPD	Gallons per day	OMB	Office of Management and Budget
HHD	Herbert Hoover Dike	OSHA	Occupational Safety and Health Administration
IAR	Incremental Adaptive Restoration	PBCWUD	Palm Beach County's Water Utilities AtDistrict
ICU	Initial CERP Update	PDT	Project Delivery Team
IFP	Integrated Financial Plan	PIR	Project Implementation Report
IMC	Interagency Modeling Center	PMP	Project Management Plan
		PPB	Parts per billion

PSTA Periphyton stormwater treatment area
 RECOVER REStoration COordination and
 VERification Team
[RLG RECOVER Leadership Group](#)
[ROD Record of Decision](#)
 SAV Submerged aquatic vegetation
 SCG Science Coordination Group
[SEI Sustainable Ecosystems Institute](#)
 SFWMD South Florida Water Management
 District
[SMA Square mile area](#)
[SSR System Status Report](#)
 STA Stormwater treatment area
 SWIM Surface Water Improvement and
 Management Act

TMDL Total maximum daily load
 TSP Tentatively Selected Plan
 TP Total phosphorus
 USACE U.S. Army Corps of Engineers
 USDA U.S. Department of Agriculture
 USEPA U.S. Environmental Protection Agency
 USGS U.S. Geological Survey
[WBSR West Basin Storage Reservoir](#)
 WCA Water Conservation Area
[WPA Water Preserve Area](#)
 WRAC Water Resources Advisory
 Commission
 WRDA Water Resources Development Act
 WRP Wetlands Reserve Program
 WY Water year

EXECUTIVE SUMMARY

Progress continues in developing and coordinating the highly complex plans and initiating action to restore the quality of the South Florida Ecosystem, one of America's most unique natural areas¹. The revised *Coordinating Success: Strategy for Restoration of the South Florida Ecosystem (Strategy)* and *Tracking Success: Biennial Report of the South Florida Ecosystem Restoration Task Force, July 2004~~6~~ - June 200~~6~~8* (*Biennial Report*), both included in Volume 1, summarize recent progress, ongoing challenges, and plans that guide the coordinated efforts of local, state, tribal, and federal governments as they implement their respective work. The *Strategy* and *Biennial Report* were prepared in accordance with Congressional guidance by the South Florida Ecosystem Restoration Task Force (hereinafter referred to as the Task Force), an intergovernmental group created by the Congress in 1996 to coordinate the restoration effort.

The purpose of the revised *Strategy* is to update the strategy document submitted to Congress in 2004~~6~~. This *Strategy* responds to Congressional direction to outline how the restoration effort will occur, identify the resources needed, establish responsibility for accomplishing actions, and link strategic goals to outcome-oriented goals. The *Strategy* describes how the restoration effort is being coordinated among many government entities to achieve broad improvements throughout the ecosystem. The *Strategy* retains the three strategic goals first published in July 2000:

- (1) get the water right;
- (2) restore, preserve, and protect natural habitats and species; and
- (3) foster compatibility of the built and natural systems. ~~(These goals and the measurable objectives are summarized in a table included in this summary.)~~

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 ~~seek out~~understand the interrelationships that exist between 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 ~~built~~ environment and lifestyle for south Florida's residents and visitors.

The success of this comprehensive approach will depend ~~upon~~ the coordination and integration of hundreds of 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 strategy is to:

- focus the efforts of its members on a shared vision and set of strategic goals and objectives for achieving that vision,
- ~~to~~ coordinate individual member projects,
- ~~to~~ track and assess progress through indicators of success, and,
- ~~to~~ facilitate the resolution of issues and conflicts as they arise.

~~To accomplish this strategy~~ Accordingly, the Task Force developed the three overarching strategic goals listed above. These goals are shown below with their and their associated sub-goals and objectives are illustrated on pages ~~XX-XX~~ and provide the framework for thise *Strategy* and the *Biennial Report*. The

¹ See Appendix C Additional View of the Miccosukee Tribe "Putting the Everglades back into Everglades Restoration." Section 1.

Strategy outlines the many programs and projects that work together. It is important to note the significant contributions from other programs toward achievement to achieve of the the Task Force's three strategic goals ecosystem restoration goals. -The Biennial Report documents the activities of the Task Force and its members and progress made between July 2006 and June 2008 in achieving the strategic goals and objectives included in the Task Force Strategy.

While The Comprehensive Everglades Restoration Plan (CERP), an effort which began in 1996 and was authorized in 2000, is vital to accomplishing all three strategic goals, with a primary but primarily focuses on goal one (get the water right). many other restoration projects are important to achieving restoration. Some of the pre-CERP projects that are also critical to achieving goal one (get the water right) include the Kissimmee River Restoration, Modified Water Deliveries to Everglades National Park, (Canal) C-111, Critical Projects, and the Everglades Construction Project. More recently delineated projects are also helping to "get the water right:" (the right quality and amount of water at the right time). The Lake Okeechobee Protection Act, expanded in 2007, includes and Estuary Recovery program, begun in 2005, is the latest action plan to help restore the ecological health of Lake Okeechobee and the St. Lucie and Caloosahatchee Estuaries (Northern Everglades and Estuaries Protection Program). In 2004, the state launched a suite of various expedited restoration projects in an effort to accelerate several projects to reach goal one. The expedited restoration projects, with an estimated construction cost of \$1.5 billion, are being implemented by the SFWMD.

The Acceler8 program, with an estimated construction cost of \$1.5 billion was launched in 2004 in efforts to expedite several projects that will help accomplish goal one.

For goal two (restore, preserve, and protect natural habitats and species), the state's Florida Forever program is the lynchpin of the effort to acquire important habitat lands for the preservation, protection, and restoration of important habitats. Other critical goal two efforts involve the prevention, control, and eradication of invasive, exotic plant and animal species.

For goal three (foster compatibility of the built and natural systems), state and local governments are improving the coordination between land use and water supply planning to ensure availability of adequate water supplies are available to meet legislative direction to support existing development but not degrade the environment, as the Legislature directed. The State of Florida's ongoing Florida Forever program increases the spatial extent of open space and multiplies its-their benefits by linking them with park, conservation, recreation, water resource, and other open space lands. These efforts help protect natural systems by providing additional habitat and serving as buffers between the natural and built environments.

The Biennial Report documents the activities of the Task Force and its members and progress made between July 2004 and June 2006 2008 in achieving the strategic goals and objectives included in the Task Force Strategy.

Restoring the Everglades is a global, national, and state priority. The South Florida Ecosystem not only supports the economy and the high-quality of life of Native American Indians and all Floridians who live there. It Floridians and Native American Indians who live there, but also enriches the national legacy of all Americans. By working cooperatively and communicating with the public in this unique conservation effort, the Task Force members seek to ensure that all interests are protected as each member works to fulfill its-their individual responsibilities to local residents and the nation at large.

**STRATEGIC GOALS AND OBJECTIVES
OF THE SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE**

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 1.75 billion gallons per day by 2030
- Objective 1-A.3: Modify ~~345~~361 miles of impediments to flow by 2020

Subgoal 1-B: Get the water quality right

- Objective 1-B.1: Construct ~~91,345~~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 2011

GOAL 2: RESTORE, PRESERVE, AND PROTECT NATURAL HABITATS & SPECIES

Subgoal 2-A: Restore, preserve, and protect natural habitats

- Objective 2-A.1: Complete acquisition of ~~5.8~~7 million acres of land identified for habitat protection by 2020
- Objective 2-A.2: Protect 20 percent of the coral reefs by 2010
- 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 and 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 2 biological control insects per year for the control of invasive exotic plants
- Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2012

GOAL 3: FOSTER COMPATIBILITY OF THE BUILT AND NATURAL SYSTEMS

Subgoal 3-A: Use and manage land in a manner compatible with ecosystem restoration

- Objective 3-A.1: Prepare a land use analysis for selected restoration projects
- Objective 3-A.2: 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.3: 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.4: Increase the number of local governments that adopt into their comprehensive plans (goals, objectives, policies, and related strategies) - concepts compatible with South Florida Ecosystem Restoration
- Objective 3-A.5: Increase the use of educational programs and initiatives to further the publics' and local governments' 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: Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments
- 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 built and 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

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STRATEGY PURPOSE AND BACKGROUND
RESTORATION STRATEGY
VISION AND INDICATORS OF SUCCESS
STRATEGIC GOALS AND OBJECTIVES

COORDINATING SUCCESS 2006⁸:

STRATEGY FOR RESTORATION OF THE SOUTH FLORIDA ECOSYSTEM

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COORDINATING SUCCESS ~~2006~~2008: STRATEGY FOR RESTORATION OF THE SOUTH FLORIDA ECOSYSTEM

STRATEGY PURPOSE AND BACKGROUND

Purpose

The purpose of *Coordinating Success ~~2006~~ 2008: Strategy for Restoration of the South Florida Ecosystem (Strategy)* is to describe how the South Florida Ecosystem Restoration Task Force (Task Force) will coordinate the intergovernmental effort to restore and sustain the imperiled South Florida Ecosystem². The American people have a strong national as well as a state and local interest in preserving this 18,000-square-mile region of subtropical uplands, wetlands, and coral reefs that extends from the Kissimmee Chain of Lakes south of Orlando through Florida Bay and the reefs southwest of the Florida Keys. The South Florida Ecosystem ~~not only~~ supports the economy and the distinctive quality of life of the Floridians and the Native American Indians who live there, ~~but also~~ and greatly enriches the shared legacy of all Americans. It encompasses many significant conservation areas, including Everglades, Biscayne, and the Dry Tortugas National Parks, the Big Cypress National Preserve, the Everglades in the Water Conservation Areas (WCAs), the Fakahatchee Strand, the Picayune Strand State Forest, the Collier-Seminole, John Pennekamp, and Jonathan Dickinson State Parks, the Rookery Bay National Estuarine Research Reserve, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and the Florida Keys National Marine Sanctuary.

Many federal, state, tribal, and local entities are working to address the ecological conditions in south Florida. The Task Force reports on and facilitates the coordination of the work. In 1999 Congress directed the Task Force to produce a restoration strategy that meets four requirements as recommended by the United States Government Accountability Office (GAO):

1. Outline how the restoration effort will occur
2. Identify the resources needed
3. Establish responsibility for accomplishing actions
4. Link the strategic goals established by the participants to outcome-oriented goals

This *Strategy* describes how the restoration effort is being coordinated. The Task Force members have agreed upon guiding principles for restoration and a vision for the results to be achieved; they have established three broad strategic goals and measurable objectives for the work needed to achieve the vision; they have identified the projects needed to achieve the objectives; they are coordinating those projects so that they are mutually supportive and non-duplicative; and they are tracking progress toward both the work-oriented strategic goals and the results-oriented vision. The vision, strategic goals, objectives, indicators of success, and individual project data (including cost, responsible agency, and targeted completion dates) are all specified in this *Strategy*. The project details are summarized in the

² See Appendix C Additional View of the Miccosukee Tribe “Putting the Everglades back into Everglades Restoration.”

Integrated Financial Plan (IFP) Summary Table provided as Appendix A in Volume 1. Additional information for each project is available in the complete IFP that is provided in Volume 2.

The Task Force *Strategy* is designed for planning purposes only, is subject to modification as needed, and is not legally binding on any of the Task Force members. Each Task Force member entity retains all of its sovereign rights, authorities, and jurisdiction for implementation of the projects identified as part of the Task Force *Strategy*.

Who Is Involved: The South Florida Ecosystem Restoration Task Force

Six federal departments (twelve agencies), seven Florida state agencies or commissions, two American Indian tribes, sixteen counties, scores of municipal governments, and interested groups and businesses from throughout south Florida participate in the restoration effort. Four sovereign entities (federal, state, and two tribes) are represented. The Task Force sought extensive involvement from local agencies, citizen groups, nonprofit organizations, and other interested parties as part of its assessment for this *Strategy*.

The Task Force was created in 1993 as a federal interagency partnership with informal participation by the State of Florida, the Seminole Tribe of Florida, and the Miccosukee Tribe of Indians of Florida. In recognition of the magnitude of the restoration effort and the critical importance of partnerships with state, tribal, and local governments, the [Water Resources Development Act of 1996 \(WRDA 1996\)](#) ~~expanded the Task Force~~ ~~was expanded to include tribal, state, and local governments.~~ ~~by the Water Resources Development Act of 1996 (WRDA 1996).~~

WRDA 1996 outlines the Task Force duties:

- Consult with, and provide recommendations to, the Secretary of the Army during development of the Comprehensive Everglades Restoration Plan (CERP)
- Coordinate development of consistent policies, strategies, plans, programs, projects, activities, and priorities for 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
- Establish a Florida-based Working Group that includes representatives of the agencies and entities represented on the Task Force as well as other governmental entities as appropriate for the purpose of formulating, recommending, coordinating, and implementing the policies, strategies, plans, programs, projects, activities, and priorities of the Task Force
- May establish advisory bodies as determined necessary to assist the Task Force in its duties, including public policy and scientific issues
- When desired, designate an existing advisory body or entity that represents a broad variety of private and public interests for additional input into their work
- Facilitate the resolution of interagency and intergovernmental conflicts associated with the restoration of the South Florida Ecosystem among agencies and entities represented on the Task Force
- Coordinate scientific and other research associated with the restoration
- Provide assistance and support to agencies and entities represented

- Prepare an integrated financial plan and recommendations for coordinated budget requests to be expended by agencies and entities on the Task Force
- Submit a biennial report to Congress that summarizes the restoration activities and progress made toward restoration

~~The original Working Group charter was updated by the Task Force in December 2003. The Task Force revised the Working Group charter to streamline and clarify its duties. To assist the Task Force in fulfilling its obligations the Working Group was tasked to develop, for Task Force approval. The duties of the Working Group are:~~

- ~~• A draft biennial report that summarizes the activities of the Task Force and progress made toward restoration;~~
- ~~• A draft integrated financial plan and recommendations for a coordinated budget request;~~
- ~~• A draft biennial update to the strategic plan; a draft biennial update to the total cost report; and,~~
- ~~• Responses to specific priority activities assigned by the Task Force.~~

The Task Force established a Science Coordination Group (SCG) in December 2003 to assist it in coordinating scientific and other research. This group was charged to develop, for Task Force approval, a draft science coordination plan that tracks and coordinates programmatic-level science and other research, identifies programmatic level priority science needs and gaps, and facilitates management decisions. The SCG also provides specific responses to priority work activities assigned by the Task Force.

The Task Force does not have any oversight or project authority, and participating agencies are responsible for meeting their own projected accomplishments. The Task Force serves as a forum in which ideas are shared and consensus is sought. This enhances the productivity of each member government or agency effort.

Brief History of South Florida Ecosystem Management

Early land developers viewed the Everglades and related habitats as worthless swamps. By the late 1800s efforts were underway to "reclaim" these swamplands for productive use. These initial efforts were encouraging, and more wetlands were drained or filled for agriculture and for residential and commercial development. Little by little, canals, roads, and buildings began to displace native habitats and disrupt historic water flows.

In 1934 national concern about the degradation of the South Florida Ecosystem led to the creation of Everglades National Park (ENP). The portion of the Everglades included in the park was to be permanently reserved as a wilderness with no development that would interfere with preserving the unique flora and fauna and the essential primitive character existing at the date of enactment. This mandate to preserve wilderness is one of the strongest in the national park system. The park was authorized by Congress in 1934 and opened to the public in 1947. Other parks and preserves were subsequently authorized (see Strategic Plan Table 1).

The Miccosukee and the Seminole Indians, whose culture and way of life depend on a healthy Everglades Ecosystem, had been living and thriving in this natural environment, which was being dramatically altered by human actions, for generations. The legislation establishing ENP specifically recognized the rights of the Miccosukee Tribe to live in the park and subsequent legislation clarified the tribe's right to live in its community along the border of the park and to govern its own affairs in perpetuity.

The South Florida Ecosystem has historically been plagued with both hurricanes and droughts. A 1928 hurricane caused Lake Okeechobee to overflow, drowning approximately 2,400 people. Droughts from 1931 to 1945 lowered groundwater levels, creating serious threats of saltwater intrusion into wells and ~~causing~~ damaging muck fires. In 1947 successive storms left 90 percent of south Florida – more than 16,000 square miles from south of Orlando to the Keys – under water for the better part of the year.

In 1948 the ongoing efforts to drain the Everglades, protect the region from hurricanes, and make the region habitable culminated in the Congressional authorization of the original Central and Southern Florida Flood Control Project that later evolved into the current Central and Southern Florida Project (C&SF), a flood control project jointly built and managed by the U.S. Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD). The C&SF Project significantly altered the region's hydrology. The primary project goal was to provide water and flood control for urban and agricultural lands. Another goal was to ensure a water supply for ENP and fish and wildlife resources in the Everglades. The first goal was achieved. The project succeeded in draining half of the original Everglades and allowing for expansion of the cities on the lower east coast of Florida and the farming area south of Lake Okeechobee known as the Everglades Agricultural Area (EAA). The second goal has not yet been accomplished. ~~The~~ Getting the correct quantity, quality, timing, and distribution of water to the South Florida Ecosystem has ~~ve~~ been the subject of much study. Many projects have been authorized to begin to restore more natural water flows to this region.

The original C&SF Project water supply component for ENP was based on the understanding of the park's hydrologic and ecologic needs at the time the plan was developed. Subsequent research has indicated the importance of hydroperiods to the health of natural systems as opposed to a conventional water supply delivery. Historically most rainwater flowed slowly across the extremely flat landscape, soaking into the region's wetlands and forming what became known as the "River of Grass." This natural functioning system began to be altered a century ago. The most significant alteration was the C&SF canal system, which by the year 2000 was comprised of over 1,800 miles of canals and levees and 200 water control structures and drained approximately 1.7 billion gallons of water per day into the Atlantic Ocean and the Gulf of Mexico. As a result, not enough water was available for the natural functioning of the Everglades or for the communities in the region and at times portions of the Everglades actually suffered from too much water. Water quality also was degraded. Excess phosphorus from agriculture and other sources polluted much of the northern Everglades and Lake Okeechobee and caused destructive changes to the food chain.

During the 1970s and 1980s public policy, in line with predominant public opinion, moved in the direction of environmental protection and restoration in south Florida. In 1972, for example, the Florida Legislature passed the Florida Water Resources Act to balance human and natural system water resource needs. In the same year the Florida Land Conservation Act was enacted to protect lands for environmental ~~protection~~ preservation and recreation. In 1983, under the leadership of Governor Bob Graham, the Save Our Everglades program was initiated to protect and restore the Kissimmee River Basin, Lake Okeechobee, the state-managed WCAs, Big Cypress Swamp, ENP, Florida Bay, and endangered wildlife. In 1987 the Florida Legislature passed the Surface Water Improvement and Management Act (SWIM), which directed the five water management districts to clean up the priority water bodies in the state. In 1988 Congress, with strong support from the State of Florida, passed the Big Cypress National Preserve Addition and Florida/Arizona Land Exchange Acts, which added 146,000 acres to the Big Cypress National Preserve. This act also affirmed the rights of the Seminole Tribe and Miccosukee Tribe of Indians to customary use and occupancy in the Preserve. In 1989 Congress passed the Everglades Expansion and Protection Act, which added 107,600 acres to ENP and authorized the Modified Water Deliveries Project to restore more natural water flows through Shark River Slough into the park.

Despite progress toward restoration in the 1980s and early 1990s, dramatic growth in the population and development of south Florida kept pressure on the environment. Research at this time detected declines in many native plant and animal species and discovered heightened phosphorus pollution in the Everglades. Particularly alarming was evidence of the decline of Florida Bay, indicated by dramatic losses in seagrass habitat, algae blooms, reductions in shrimp and many fish species, and a decline in water clarity.

In 1988 the federal government sued 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, thereby causing a violation of state water quality standards and causing conditions that allowed for the replacement of native species in the Everglades marsh with invasive vegetation. After three years and much additional litigation, no settlement had been reached. In 1991 Governor Lawton Chiles agreed to reach a settlement. For several years, mediation efforts helped reduce the scope of conflict between the state and federal governments and between agricultural and environmental interests. In February 1992 a court settlement was achieved to reduce the level of phosphorus entering ENP and the Arthur R. Marshall Loxahatchee National Wildlife Refuge (NWR) by creating artificial wetlands designed to process and remove nutrients from agricultural runoff. In 1993 the sugar industry agreed to adopt best management practices (BMPs) and to pay for approximately one-third of the costs of the artificial wetlands to help reduce the phosphorous pollution in the Everglades. The settlement also called for additional measures to be implemented over the long term to meet a numeric phosphorus criterion for Class III waters.

The mid-1990s saw the establishment of two important consensus building forums for Everglades issues. In 1993 the Task Force was established through a federal interagency agreement. In recognition of the magnitude of the restoration effort and the critical importance of partnerships with state, tribal, and local governments, the Task Force was formalized and expanded to include tribal, state, and local governments in WRDA 1996. In 1994 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." The Task Force and the GCSSF were instrumental in formulating consensus in the early stages of Everglades restoration.

In 1996 two significant pieces of legislation were approved by the U.S. Congress. The Federal Agriculture Improvement and Reform Act (the Farm Bill) provided \$200 million to conduct restoration activities in the Everglades Ecosystem, including land acquisition, resource protection, and resource maintenance. The second piece of legislation, WRDA 1996, clarified Congressional guidance to the USACE to develop a comprehensive review study for restoring the hydrology of south Florida. This study, commonly referred to as "the Restudy," has since resulted in the CERP, a consensus plan that was approved by Congress and signed by the president as part of WRDA 2000. The CERP is designed to reverse unintended consequences resulting from the operation of the C&SF Project. The physical limitations of the existing water management system still have the potential to exacerbate resource conflicts. Implementation of the CERP should increase the system's flexibility, helping water managers avoid such conflicts. In 2000 Governor Jeb Bush proposed, and the legislature passed, the Everglades Restoration and Investment Act, which committed the state to provide \$2 billion over 10 years to implement the first 10 years of the CERP.

The Seminole and Miccosukee Tribes, which have maintained their way of life in this natural system, became active participants in the dialogue on restoration and were formally added to the Task Force under WRDA 1996. In 1934, the Enabling Act establishing ENP recognized the right of the Miccosukee Tribe of Indians to continue to live in their traditional homeland. In 1998, Congress passed the Miccosukee Reserved Area Act which clarified the rights of the Miccosukee Tribe to live in the park and set aside 666.6 acres along its border for the tribe to govern its own affairs in perpetuity. The presence of

two Indian tribes living in the Everglades, whose culture and way of life depend on the health of this ecosystem, is an important reason to restore the ecosystem.

The growing body of federal and state legislation and regulatory approvals directed at managing growth and protecting the natural environment is summarized in Strategic Plan Table 1.

Strategic Plan Table 1 – Significant Events in South Florida Ecosystem Management

1934	Everglades National Park is authorized.
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	Task Force is established to coordinate ecosystem restoration efforts in south Florida.

- 1993 Seminole Tribe is approved by the U.S. Environmental Protection Agency (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.
- 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 National Park Service and the Fish and Wildlife Service 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 \$1.4 billion in authorizations for 10 initial Everglades infrastructure projects, four pilot projects, and an adaptive management and monitoring program; also grants programmatic authority for projects with immediate and substantial restoration benefits at a total cost of \$206 million; 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 Florida DEP 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 (CSOP) 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’s~~ [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. See Appendix X](#)
- [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 \(Northern Everglades and Estuaries Protection Program\).](#)

What Is at Stake

Current efforts to restore the South Florida Ecosystem must address a century of changes to the environment that have put the ecosystem in jeopardy. The seriousness of the problem was fully evident during the initial strategic planning process of the Task Force in 2000. Problems noted at that time included:

- Fifty percent reduction in the original extent of the Everglades, including important habitat and groundwater recharge areas
- Ninety percent reductions in some wading bird populations
- Sixty-nine species on the federal [threatened and](#) endangered ~~or threatened~~ [species](#) list
- Declines in commercial fisheries in Biscayne and Florida Bays
- Loss of over five feet of organic soil in the EAA
- Decline in the clarity of water in the Florida Keys
- Infestations of exotic plant species on over 1.5 million acres
- Damaging freshwater releases into the St. Lucie and Caloosahatchee Estuaries
- Loss of 40,000 acres of grass beds in Lake Okeechobee
- Loss of tree islands and damaging ecological effects in the state-managed WCAs
- Loss of 37 percent of living corals at 40 sites in the Florida Keys National Marine Sanctuary from 1996 to 2000

In ~~2006~~2008, south Florida is [now](#) home to over ~~6.5~~9 million people, ~~and the population is expected to double by 2050~~. The region also receives more than 37 million tourists annually. The quality of life in south Florida and the region’s \$200 billion economy depend on the health and vitality of the natural system. If the coral reefs, estuaries, and shallow waters of Florida Bay cannot support populations of

aquatic species, south Florida's tourism industry and associated economy will decline. The loss of fertile soil and conversion of land to nonagricultural uses will make farming and ranching harder to maintain and less profitable.

The stakes are high. The South Florida Ecosystem once supported some of the greatest biodiversity on earth. The biological abundance and the aesthetic values of the natural system warrant regional, national, and even international interest and concern. In addition to numerous local parks and private conservation areas, south Florida encompasses Federal Indian Reservations; thirty state parks; numerous state forests and wildlife management areas; seventeen state aquatic preserves; thirteen federal wildlife refuges; a national marine sanctuary; three national parks; a national preserve; and a national estuarine research reserve. ENP has been designated a world heritage site, a wetland of international significance, and an international biosphere reserve. Biosphere reserves are protected examples of the world's major ecosystem types, which are intended to serve as standards for measuring human impacts on the environment worldwide.

RESTORATION STRATEGY

The Task Force *Strategy* includes a set of guiding principles, which have been adopted by the Task Force member agencies to guide all aspects of ecosystem restoration, and a clear definition of the roles of the Task Force as a coordinating, facilitating, and reporting body. Each of these is described separately in this chapter.

Guiding Principles

[The Ecosystem Must Be Managed as a Whole](#)

This is the overall premise that guides ecosystem planning and management. It demands that managers, scientists, and the public view the natural and the built environments and the resources needed to support them as parts of a single larger system. The 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 responsibilities that can be coordinated but not shared. For example, the state retains exclusive responsibility for all land management and water use except for lands and waters specifically reserved by the federal government or the Miccosukee or Seminole Tribes.

Holistic management by a variety of jurisdictions will require broad-based partnerships, coordinated management, and considerable public outreach and communication.

Broad-based Partnerships

It is critical that federal, state, local, and tribal governments and other interested and affected parties work together in broad-based partnerships. Maintaining open communication and examining different views and needs will form the basis for the respect and trust needed to work together.

Coordinated Management

To be successful, governmental entities will need to coordinate their ecosystem restoration activities, including the coordination of land and water use and the development of cooperative programs. The Task Force will foster this cooperation and facilitate the resolution of conflicts and disputes among the diverse participants.

Public Outreach and Communication

Innovative partnerships and coordinated management will not be possible without the understanding, trust, and support of the public, including historically underserved communities and neighborhoods. Therefore, public outreach and communication will be an important part of the ecosystem restoration efforts. Outreach strategies will seek two-way communication with all public sectors to broaden understanding and to instill a sense of stewardship among all south Floridians and visitors.

[The Natural and Built Environments Are Inextricably Linked in the Ecosystem](#)

Understanding the complexities of the South Florida Ecosystem is daunting. Until recently, the term ecosystem generally referred to the natural environment. However, the ecosystem also includes people and their built environment, which is inextricably linked to the natural environment. Events in the built

environment can have catastrophic consequences in the natural environment, such as the destruction of wetlands when they are drained for development. Similarly, disruptions in the natural environment can have catastrophic consequences in the built environment, such as the unnaturally severe flooding that occurs when natural wetlands are gone.

The Task Force recognizes that the restoration of the South Florida Ecosystem is not possible if subsequent decisions about the built environment are not consistent with ecosystem health. At the same time, the solutions to restore ecosystem health must be supportive of human needs. These links make it critical that decision-makers for both the natural and the built environments be involved in the restoration effort.

Expectations Should Be Reasonable

Major ecological improvements will take many years to realize in south Florida. The large-scale hydrological improvements that will be necessary to stimulate major ecological improvements will depend upon and follow the implementation of CERP features designed to substantially increase the water storage capabilities of the regional system and to provide the infrastructure needed to move the water. Other features of the CERP must be in place before the additional storage and distribution components can be constructed and operated. Substantial alteration and degradation of the South Florida Ecosystem has occurred over many decades, and it will take decades to reverse this process.

Decisions Must Be Based on Sound Science

Science plays two major roles in the restoration process. One is to facilitate and promote the application of existing scientific information to planning and decision-making. The other is to acquire critical missing information that can improve the probability that restoration objectives will be met.

The Task Force has adopted an adaptive management process, authorized by Congress in WRDA 2000, ~~that-which~~ will continuously provide managers with updated scientific information, ~~which-and~~ will then be used to guide critical decisions. In this process, scientific models provide a conceptual framework and identify critical support studies. Support studies provide data and analysis that lead to better understanding of problems and the development of alternative solutions. Monitoring may be used to help establish a baseline, and once an alternative is implemented, to assess the effectiveness of the action and provide feedback on ways to modify it (if warranted). Similarly, monitoring data can be used to revise and refine the original concepts and models, thereby continuing an interactive feedback loop of decision-making, implementation, and assessment.

The importance of adaptive management has been reiterated by the Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) in their report, *Progress Toward Restoring the Everglades: The First Biennial Review, 2006*. The report introduced the term Incremental Adaptive Restoration which recommends that projects which provide immediate benefits and address scientific uncertainties to enhance implementation efficiencies be implemented early.

Economic Equity and Environmental Justice Need to Be Integrated into Restoration Efforts

The federal members of the Task Force are directed by federal law and executive orders to promote economic equity and environmental justice through fair treatment of all persons, regardless of color, creed, or belief.

In WRDA 2000 Congress specifically recognized the importance of ensuring that small business concerns were addressed during the implementation of CERP. Fair treatment associated with economic equity includes efforts required to expand opportunities to small business concerns, including those controlled

by socially and economically disadvantaged individuals and persons with limited proficiency in English. Additional targeted efforts will be needed to provide opportunities to socially and economically disadvantaged individuals and small businesses to participate in the implementation of restoration programs and projects.

Fair treatment associated with environmental justice means that no group of people, including no racial, ethnic, or socioeconomic group, should bear a disproportionate share of any negative environmental consequences resulting from industrial, municipal, or commercial operations or the execution of federal, state, or local programs or policies.

In WRDA 2000 Congress specifically recognized the importance of ensuring to the maximum extent practicable, that public outreach and educational opportunities are provided to all the individuals of south Florida.

The unique cultural and ethnic diversity of south Florida's population, with its strong representation of peoples from all over the world, will require significant efforts on behalf of the restoration partners to ensure that projects are implemented in ways that do not result in disproportionate impacts on any communities.

The Task Force and Working Group see this guiding principle as critical to long-term success. The Working Group established a task team for outreach and environmental and economic equity. The team solicited input about the various restoration outreach efforts of member agencies and developed an inventory of these efforts.

Restoration Must Meet Applicable Federal Indian Trust Responsibilities

The restoration of the South Florida Ecosystem involves a unique partnership between the Indian tribes of south Florida and the federal, state, and local governments. In carrying out the Task Force's responsibilities laid out in WRDA 2000, the Secretary of the Interior must fulfill the obligations to the Indian tribes in Florida specified under the Indian Trust Doctrine, and other applicable legal obligations³. All federal agencies have a trust responsibility and are responsible for meaningful consultation with the tribes under Executive Order 13175 and Secretarial Order 3206.

Task Force Roles in the Coordination of the Restoration Effort

The role of the Task Force is to facilitate the coordination of conservation and restoration efforts implemented through a combination of federal, state, local, and tribal initiatives in south Florida. It provides a forum for the participating agencies to share information about their restoration projects, resolve conflicts, and report on progress. Congress and the public are particularly interested in how each individual agency's efforts contribute to the larger framework of total ecosystem restoration. The Task Force *Strategy* and *Biennial Report* are critical vehicles for sharing information and coordination.

Providing a forum for consensus building and issue engagement is a collaborative role, not one in which the Task Force can dictate to its members. Because on-the-ground restoration is accomplished through the efforts of the individual Task Force member agencies, they are the ones that are ultimately responsible for their particular programs, projects, and associated funding. This is an important distinction. Each member is accountable individually to its appropriate authorities and to each other for the success of the

³ See Appendix C Additional View of the Miccosukee Tribe "Putting the Everglades back into Everglades Restoration." Section III.

restoration. The Task Force has no overriding authority to direct its members. Instead the Task Force's ~~role of~~ coordination role complements the implementation roles of its members.

The Task Force meets regularly to report on progress, facilitate consensus, and identify opportunities for improvement. The Task Force members coordinate and track the restoration effort as follows.

Focus on Goals

The Task Force *Strategy* establishes strategic goals and measures of success that represent the scope of the restoration initiative and answer these fundamental questions: What will the restoration partners accomplish? When will the restoration effort be done? What key indicators will signal progress and success?

Coordinate Projects

To be effective, individual projects should contribute to the vision and strategic goals, be consistent with all the guiding principles, be timely, and support rather than duplicate other efforts. The Task Force *Strategy* includes a master list of restoration projects that compiles information about goals and objectives, start and finish dates, lead agencies, and funding (see Appendix A). The IFP in Volume 2 provides additional details about all of these projects.

Track and Assess Progress

The Task Force facilitates the coordination of the ecological monitoring ~~adaptive management~~ processes used by the member agencies to track and assess restoration progress. Because natural systems are complex, it is difficult to predict how they will respond to management actions to encourage habitat restoration. Consequently, member agencies have chosen to use an adaptive management (AM) approach to address these uncertainties. AM is a management approach that addresses uncertainties regarding predicted restoration responses through monitoring and assessment of actual project(s) performance compared to expected results based on system-wide indicators. AM also introduces robust and flexible designs for projects and their operations to provide options to adjust current and future management actions based on assessed monitoring results. Adaptive management, an important restoration concept, involves constantly monitoring project contributions, indicators of success, and current scientific information to determine the actual versus expected results of various actions. This process acknowledges that not all the data needed to restore the South Florida Ecosystem is currently available and that as additional knowledge is gained through field experimentation, project implementation, or operational adjustment, managers will have increased confidence in their decision-making ~~are available now.~~

As project managers track incremental progress in restoration objectives, confirmed restoration success may be conveyed to the Task Force members or performance issues can be raised that require some type of adjustment through the AM process. Detecting problems early allows managers to make the following potential adjustments to minimize impacts on the total restoration effort: (1) revise current and future project design, (2) evaluate changing resource needs, (3) adjust project operations, (4) work collaboratively on projects that fall behind, or (5) add new projects. achieving objectives, they may raise "red flags" alerting the Task Force members that a project (1) is not on schedule or (2) is not producing the anticipated results. The ability to anticipate problems early helps to minimize their effect on the total restoration effort. Management responses may involve revising the project design, evaluating changing resource needs, or working collaboratively on projects that fall behind. Projects that are not producing the anticipated results may be replaced with new projects. Because each Task Force member is responsible for its particular programs, projects, and funding, such decisions are made by the entities involved. The

Task Force will modify the [South Florida Ecosystem Restoration](#) strategic goals and objectives as relevant information becomes available.

Recognize and Work with Conflicting Goals

As restoration activities move forward in south Florida, there may be occasional conflicts between the strategic goals described in this *Strategy* and individual agency programs or missions. When such conflicts occur, the strategic goals should prevail whenever possible, and it is the statutory duty of the Task Force to facilitate their resolution in ways that advance the strategic goals of restoring natural hydrology and ecology throughout south Florida. The Task Force recognizes that it may on occasion be appropriate to take short-term or interim management actions that are not immediately consistent with long-range strategic goals, while allowing time for other activities more consistent with strategic goals to take effect⁴. The Task Force is committed to facilitating the resolution of these issues, consistent with its statutory duties, without compromising its long-term focus on restoring natural conditions to south Florida. Where there may be conflicts between existing statutes and strategic goals, the Task Force recognizes that it may be necessary to have Congress address such issues.

Facilitate the Resolution of Issues and Conflicts

Disagreements and conflict are to be expected given the scope, complexity, and large number of sponsors and interests involved in ecosystem restoration. The ability of the Task Force to resolve conflicts is complicated by the large number of governmental entities involved at the federal, state, tribal, and local levels, the differing, and sometimes conflicting, legal mandates and agency missions among the entities involved, and the diverse public interests, which include environmental, agricultural, Native American, urban, recreational, and commercial values.

The Task Force will facilitate the prevention and resolution of conflict to the extent possible by clarifying the issue(s), identifying public concerns, obtaining and analyzing relevant information, and identifying possible solutions. Although these efforts are intended to facilitate conflict resolution, opportunities will always exist for parties to pursue conflicts through litigation. Litigation may prove to be time consuming, costly, and uncertain, and it may divert resources from restoration efforts⁵.

Changes made through project coordination, adaptive management, and the conflict resolution process will be incorporated into future editions of this *Strategy*.

⁴ See Appendix C Additional View of the Miccosukee Tribe “Putting the Everglades back into Everglades Restoration.” Section II.B.2

⁵ See Appendix C Additional View of the Miccosukee Tribe “Putting the Everglades back into Everglades Restoration.” Section II.A.1.

VISION AND INDICATORS OF SUCCESS

One of the first actions of the Task Force was to describe a vision for a resulting condition of the South Florida Ecosystem that all the member agencies could strongly support. Translating that vision into discernable and measurable terms is an ongoing process supported by intensive discussion, research, and monitoring. Teams of scientists are working to develop and refine the indicators that the Task Force will use to know when they have finally achieved their vision. The Task Force vision is presented below, followed by a discussion of the indicators of success.

Vision

The participants in the South Florida Ecosystem Restoration Task Force share this vision:

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

To this end, hundreds of different entities have been working to restore and preserve more natural hydrology in the ecosystem, to protect the spatial extent and quality of remaining habitat, to promote the return of abundant populations of native plants and animals, and to foster human development compatible with sustaining a healthy ecosystem. These efforts, which are described in detail in the "Strategic Goals and Objectives" section of the *Strategy*, will continue. The results will be continuously analyzed to provide restoration managers with increasingly comprehensive information about what remains to be done to achieve ecosystem restoration.

The Task Force members believe that the efforts described in this *Strategy*, managed through an adaptive management process, will achieve their vision. The region's rich and varied habitats – Biscayne Bay; Lake Okeechobee; the Wild and Scenic Loxahatchee River; the Caloosahatchee, St. Lucie, and other estuaries; the Everglades, mangroves, coastal marshes, and seagrass beds of south Florida; and the coral reef ecosystem of the Florida Reef Tract – will become healthy feeding, nesting, and breeding grounds for diverse and abundant fish and wildlife. The American crocodile, manatee, snail kite, Cape Sable seaside sparrow, and other endangered species will recover. The large nesting rookeries of herons, egrets, ibis, and storks will return. 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. While it is very likely to be healthier than the current ecosystem, it will not completely match the predrainage system. The irreversible physical changes made to the ecosystem make restoration to pristine conditions impossible. The restored Everglades will be smaller and ~~arranged~~ somewhat differently ~~arranged~~ 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.

Indicators of Success

The Task Force recognizes that restoration must be based on the best science available and that this will require use of adaptive management principles to continually incorporate new knowledge and tools. Over the prior four reporting periods (1998-2000, 2000-2002, 2002-2004 and 2004-2006), a great deal of modeling and analysis has generated new information providing the technical and scientific basis for developing a more integrated and rigorous set of indicators than was originally included in the 2002 report. To that end, the Task Force, ~~The Task Force and~~ created the Science Coordination Group (SCG) in December 2003 to support its efforts to coordinate the scientific aspects of policies, strategies, plans, programs, projects, activities, and priorities and to respond to Congressional directives to improve science coordination based on GAO’s recommendations. In August 2004, the Task Force assigned this group the task duty of developing a proposed integrated suite of System-wide Indicators for helping assess the direction and success of the restoration efforts. ~~This suite of System-wide Indicators replaces updating~~ the indicators reported in the 2002 *Strategy and Biennial Report*.

Over the past three reporting periods (1998-2000, 2000-2002, and 2002-2004), a great deal of modeling and analysis has generated new information providing the technical and scientific basis for developing a more integrated and rigorous set of indicators than was originally included in the 2002 report. After examination of comments from an Independent Scientific Review and public comments, the SCG developed a suite of proposed ~~System~~system-wide Indicators ~~for in~~ 2006. In September 2006, the Task force approved a suite of 11 ecological indicators for use in assessing the progress of Everglades restoration. The selected indicators are organism based and represent attributes in the Everglades conceptual ecological models. The current suite of indicators was chosen to provide the Task Force and Congress with the broadest scale of information for a “top-of-the-mountain” assessment of ongoing restoration activities, and identified additional indicator gaps they hope to have developed by the 2008 reporting timeframe. There are general desired restoration trends identified for each indicator, but they are not yet well developed or refined enough to set performance targets or end points. The SCG is working on refining these restoration targets and expects to report their findings to the Task Force in 2008 when the first assessment of the entire suite of indicators is anticipated. The SCG will use the feedback from public input and an independent scientific review process to complete the indicators, targets, performance measures, and timelines used to measure success⁶.

Strategic Plan Table 2 – Task Force System-wide Indicators for 2006 2008	
<u>Ecological Indicators</u>	
•	Fish and Macro invertebrates
•	Wading Birds (White Ibis, and Wood Stork,) and <u>Wading Birds</u> (Roseate Spoonbill)
•	Florida Bay Submerged Aquatic Vegetation
•	Florida Bay Algal Blooms
•	Crocodilians (American Alligators and Crocodiles)
•	American Oysters
•	Periphyton and Epiphyton
•	Juvenile Pink Shrimp
•	Lake Okeechobee Littoral Zone
•	Invasive Exotic Species
<u>Compatibility Indicators</u>	
•	Water Volume
•	Biscayne Aquifer Saltwater Intrusion
•	Flood Protection – C-111 Basin

⁶ See Appendix C Additional View of the Miccosukee Tribe “Putting the Everglades back into Everglades Restoration.” Section II.B.5.

Ecological Indicators

Fish and Macroinvertebrates

Significance and background. Marsh and estuarine aquatic fauna, including small fishes and crustaceans, are critical in the food web as primary and secondary consumers and as prey for focal Everglades predators such as wading birds. This indicator uses the density (number of animals per unit area) and community composition (how many of each species per unit area) of a suite of native fishes (e.g., eastern mosquito fish, bluefin killifish, sheepshead minnows, sailfin molly) and crustaceans (slough and Everglades crayfish, riverine grass shrimp) to describe trends in their populations related to hydrology.

Fish and macroinvertebrate responses are directly related to the suitability of environmental conditions. Correlations between biological responses and environmental conditions contribute to an understanding of the species' status and trends over time. The positive or negative trends of this indicator relative to hydrological changes permit an assessment of positive or negative trends in restoration.

Factors affecting success. The most important factors affecting fish abundances regionally are the loss of habitat, hydroperiod, and water depth and frequency of drying events. Because of relatively dry hydrological conditions in the Everglades Ecosystem resulting from water management over the past several decades, and a loss of habitat to agricultural and urban uses, fish and macroinvertebrate densities have decreased and community structure has changed.

Toward restoration. The broad restoration goals for this indicator are to enhance population density and community composition of fish and macroinvertebrates through hydrologic restoration and improved water management.

Wading Birds (White Ibis, Wood Stork, and Roseate Spoonbill)

Significance and background. Extremely large numbers of wading birds were one of the defining characteristics of the pre-drainage wetlands of south Florida. Of particular relevance in understanding the population dynamics of wading birds in the pre-drainage system are the combined features of large spatial extent and highly variable hydrological conditions that created and maintained a mosaic of wetland habitats. This combination is what made it possible for the region to support large nesting colonies of wading birds with quite different foraging strategies and prey requirements.

Factors affecting success. The drainage of extensive areas of short-hydroperiod wetlands, large-scaled alterations in water depth and distribution patterns due to compartmentalization of wetlands in the central Everglades, and the reduction of freshwater flows into the formerly more productive estuaries are the human induced stressors that have substantially impacted ibis, storks, spoonbills, and other wading birds in south Florida. The number of ibis nesting in south Florida has declined from an estimated 100,000 – 200,000 birds in the 1930s and 1940s to 20,000 – 60,000 birds since the late 1990s. The number of nesting storks has declined from 14,000 – 20,000 birds prior to 1960 to about 2,000 – 5,000 birds since the late 1990s.

Toward restoration. The broad restoration goals for this indicator are recovering the kind of ecosystem with the spatial and temporal variability to support large numbers of these wading birds. This will include specific restoration goals for these species with targets defined for numbers of nesting pairs, location of colonies, timing of nesting, and an increase in the size and frequency of the larger nesting assemblages referred to as “super colonies.”

Florida Bay Submerged Aquatic Vegetation

Significance and background. Florida Bay and adjacent areas of the Florida Keys and southwest Florida coastal zone contain one of the largest contiguous seagrass beds in world. Within Florida Bay, seagrasses

are the dominant biological community, covering 90 percent of the 180,000 hectares of the bay's subtidal mudbanks and basins. Submerged aquatic vegetation (SAV) is well documented as a community that serves many critical functions within estuarine and coastal ecosystems, including habitat for higher trophic level species, a base of primary production for the food web, and a beneficial influence on water quality through sediment stabilization and nutrient retention. A conceptual ecological model of Florida Bay, developed for the Restoration Coordination and Verification Team (RECOVER), identifies the SAV community and its structure and dynamics as being central to the health of the entire Florida Bay ecosystem – the condition of this community is an essential indicator for South Florida Ecosystem restoration.

Factors affecting success. The SAV indicator for the southern estuaries focuses only on Florida Bay as it currently has the best models available for this indicator. Changes in the seagrass community of Florida Bay have been one of the primary drivers behind a public call for Everglades restoration. Starting in 1987, a mass-mortality event or “die-off” of SAV through much of central and western Florida Bay devastated the once lush seagrass beds. This die-off initiated a cycle of changes in the Florida Bay ecosystem, likely due to increased sediment suspension, turbidity, nutrient mobilization, and phytoplankton blooms resulting in decreased light that caused additional seagrass mortality. The extent to which fish and birds will recover following a sustained recovery of these plants remains to be seen and is a major focus of ongoing research.

Toward restoration. The broad restoration goal for this indicator is an increase in two species, *Halodule wrightii* and *Ruppia maritima*, that are associated with relatively lower salinities and are far less common than the dominant species, *Thalassia testudinum*, and greater species richness and density through a greater proportion of the bay. Another restoration goal is widespread SAV coverage that includes increases in species diversity and richness with moderate density with overall vegetation coverage similar to those found prior to the 1987 “die-off.”

Florida Bay Algal Blooms

Significance and background. Algal blooms are a major concern regarding the current and future health of Florida Bay, as well as of waters near the Florida Keys and the southwest Florida coastal zone. The initiation of algal blooms in Florida Bay in 1991, following the seagrass mass-mortality event of the late 1980s, has been a major element of ecological change. Algal blooms decrease light penetration through the water column and can lead to seagrass mortality, which in turn can release nutrients and stimulate more algal blooms.

Factors affecting success. The role of nutrient inputs from the Everglades as a cause of Florida Bay algal blooms is not clear, but it has been hypothesized that these inputs are an important factor and increased freshwater flow with restoration could increase such blooms. The algal bloom indicator reflects overall water quality and is based on the assessment and evaluation of chlorophyll-a concentrations in the water column. The indicator has three components: bloom magnitude, frequency, and spatial extent.

Toward restoration. The broad restoration goal for this indicator is to reduce or eliminate the number and extent of algal blooms in the watershed.

Crocodylians (American Alligators and Crocodiles)

Significance and background. Crocodylians are important in south Florida wetlands and play a major role in influencing the overall health and ecological patterns of the region. Alligators and crocodiles are critical in the food web as top predators, influencing abundance and composition of prey. The American alligator's behavior creates variations in physical conditions that otherwise would not exist in the Everglades landscape such as the holes they dig that become habitat for other species. The American

crocodile is an endangered species representing the importance of freshwater inflow to estuarine health and productivity.

Factors affecting success. Reproduction, growth, and survival of crocodilians are dependent on food availability – birds, mammals, fish, and macroinvertebrates – that, in turn, are entirely dependent on hydrologic conditions. Loss of flow and relatively dry hydrologic conditions, resulting from water management over the past several decades and a loss of habitat in the Everglades, have adversely affected alligators and crocodiles. Loss of habitat in southern marl prairies and rocky glades and reduction in depth and period of inundation of remaining areas have reduced abundance of alligators and alligator holes in these habitats. Reduced prey availability throughout the system as a result of hydrologic alterations corresponds with lower growth rates, survival, and reproduction of alligators.

In estuaries, crocodilians of all species orient towards areas of low salinity and sources of freshwater. In mangrove estuaries, alteration of location and quantity of freshwater flow has lowered the relative density of crocodiles where freshwater has been diverted and decreased growth and survival of juvenile crocodiles throughout the estuary in areas of higher salinities. Reduced freshwater flow into the mangrove estuaries also has resulted in succession of former freshwater mangrove areas to saltwater systems, reducing American alligator populations in tidal rivers and tributaries. Finally, a large portion of the adult alligator population in the Everglades exists in canals but does not contribute to population growth due to the combination of increased nest flooding and decreased hatching and juvenile survival during low water periods (predation and cannibalism).

Toward restoration. The broad restoration goal for this indicator is based on recovery of more natural hydropatterns regionally, which in turn will promote increased habitat quantity and improved habitat quality that will support healthy populations of these species. The alligator indicator uses relative density (reported as an encounter rate), body condition, nesting effort and success, and occupancy rates of alligator holes, while the crocodile indicator uses relative density, growth, and survival to describe trends in their populations related to hydrology.

For example, alligators are now largely absent from over-drained rocky glades and marl prairies, and hence are no longer creating alligator holes. As restoration proceeds the occupancy rate of alligator holes should increase, providing ecosystem services for other species. With the resumption of natural patterns of volume, timing, and distribution of flow to the Everglades, the American alligator is expected to repopulate and resume nesting in the rocky glades and the freshwater reaches of tidal rivers in the mangrove estuaries and will increase in population size and body condition throughout most of the Everglades wetlands.

American Oysters

Significance and background. Oysters are indicative of ecosystem health as a whole. They are natural components of estuaries along the eastern seaboard of the United States as well as the Gulf of Mexico and were documented to once be abundant in the South Florida Ecosystem. The American oyster is the dominant species in these oyster reef communities. Oyster bars provide important habitat and food for numerous estuarine species including mollusks, worms, crustaceans, sponges, fish, and birds. Oysters are also an important commercial and recreational resource. The American oyster improves water quality by filtering particles from the water, serves as prey and habitat for numerous other organisms, and plays an important role in the estuarine food chain. Salinity conditions suitable for oysters also produce optimal conditions suitable for a suite of other desirable estuarine organisms. In the Caloosahatchee, Loxahatchee, and St. Lucie Estuaries, oysters have been identified as a valued ecosystem component.

Factors affecting success. Historically, rainfall on the watershed was detained in natural wetland systems and gradually percolated into the groundwater, evaporated, and/or flowed overland into tributaries. As

south Florida developed, the canal network built as a result of the C&SF Project drastically altered the quantity, quality, timing, and distribution of freshwater entering the system. Resultant rapid changes in salinity resulted in degradation of biological integrity of the system and introduced contaminants from urban and agricultural development, including excess suspended solids, nutrients, pesticides, and other harmful pollutants. Inflows became extremely variable and tended to be too great in the wet season and too little in the dry season to support a healthy estuary. The inflow extremes and degraded water quality (particularly suspended solids and nutrients) severely compromise the development of healthy, sustainable oyster and related estuarine communities.

Toward restoration. The broad restoration goal for this indicator in the northern estuaries is the restoration of oyster beds within the St. Lucie, Caloosahatchee, Loxahatchee, and Lake Worth Lagoon Estuaries, including the restoration of habitat function and oyster health in areas that become suitable habitat. Acre increases are identified in the 2005 RECOVER *Interim Goals and Targets* [recommendation report](#) ~~but~~ and these ~~need to be~~ [currently being](#) further ~~refined~~ [defined](#) as to locations and definition of what an acre of oysters means (i.e. how many oysters per meter square, what quality, reproductive capacity, etc.).

Periphyton and Epiphyton

Significance and background. Periphyton communities, comprised of algae, floating plants, and associated animals, are a common feature of Everglades marshes and respond strongly to alterations in hydrologic conditions and water quality, especially phosphorus. Epiphyton communities are also comprised of algae and associated animals, but instead of floating are attached to other plants and underwater surfaces. Both periphyton and epiphyton are important both as a food source and a refuge for aquatic invertebrates that are consumed by small fish, crayfish, and grass shrimp. Periphyton has been studied extensively in the Everglades because of its utility as an early warning indicator of impending ecosystem change and the significant consequences of altered periphyton communities on the rest of the food web. Epiphyton serves much the same role as periphyton but is primarily associated with estuarine and coastal ecosystems, particularly seagrass beds.

Factors affecting success. Increased nutrient delivery to natural Everglades marshes causes periphyton mats to disintegrate and collapse, resulting in a major alteration in food availability at the base of the food web. Research shows periphyton losses are initiated upon exposure to even very low nutrient enhancements. Models have been developed to determine the extent of periphyton losses throughout the South Florida Ecosystem because of nutrient enrichment. Further, hydrologic changes have strong functional and structural consequences in the periphyton community. Studies have shown that sites that are dry for a majority of the year have minimal production values, while sites that are flooded for less than six months are most productive. The timing of reflooding of previously dried periphyton mats is also important as dried periphyton releases large quantities of nutrients into the water column upon reflooding that subsequently may negatively affect downstream systems. Periphyton cover, biomass, productivity, and composition are affected by the duration and frequency of droughts. The reduction of hydroperiod resulting from long-term water and land management practices has limited the period of production for periphyton in Everglades wetlands for many decades. Recovery of this indicator will depend on hydrological restoration to improve habitat for periphyton production in both long and short hydroperiod wetlands.

Toward restoration. The broad restoration goal for this indicator is to increase the periphyton mat cover, structure, and composition to periphyton communities that were characteristic of the spatially distinct hydroperiods and low nutrient conditions that were present in the greater Everglades wetland communities historically.

Juvenile Pink Shrimp

Significance and background. Pink shrimp are important both economically and ecologically in south Florida and are a core component of the ecologic food chain. Juvenile pink shrimp are present in coastal waters throughout south Florida and densities are highest in western Florida Bay. Biscayne Bay supports small local fisheries for food shrimp and bait shrimp. The growth and survival of young pink shrimp is influenced by salinity.

Factors affecting success. Historically, water management practices have changed the quantity, timing, and distribution of freshwater inflow to estuaries, which have affected the frequency and rate of salinity change. Both Florida Bay and parts of Biscayne Bay have been subjected to prolonged hypersaline conditions. Eastern Florida Bay, Whitewater Bay, and Biscayne Bay experience large, rapid changes in salinity.

Restoration of flows more similar to rainfall-driven flows should benefit the Tortugas pink shrimp fishery. The potential for improving shrimp nursery habitat in Florida Bay may be greatest in the north-central bay, where water management changes associated with the CERP could potentially reduce the frequency, spatial extent, and duration of hypersaline conditions.

Toward restoration. The broad restoration goal for this indicator is increased juvenile pink shrimp density at peak abundance during the August-October period in optimal habitat (seagrass) in three regions of Florida Bay, in Ponce de Leon Bay on the lower southwestern mangrove coast, and in western nearshore southern Biscayne Bay.

Lake Okeechobee Littoral Zone

Significance and background. The SAV in Lake Okeechobee provides nesting habitat and food resources for economically important sport fish populations, wading birds, migratory waterfowl, alligators, and the federally-listed endangered Everglades snail kite. In addition, the SAV community stabilizes shoreline sediments and supports attached algae that help to remove phosphorus from the water. The littoral zone emergent vegetation community in the lake covers an area larger than 400 square kilometers.

Factors affecting success. Florida has an annual rainfall cycle that can lead to prolonged or extreme high or low lake levels that in turn can stress the ecosystem. The spatial extent of the SAV in the lake has fluctuated significantly over the years according to wet and dry years and management schedules. Just after a period of low water levels in 1989 to 1991, between 43,000 and 51,000 total SAV acres were found. In 1998, after many years of high lake levels, a rough estimate indicated that only 3,000 acres of total SAV remained in the lake. In July 2002, the spatial extent of SAV was back up to 43,000 acres, though not all desirable species. In the most recent sampling, conducted in August 2004, the total acres had increased to nearly 55,000.

Toward restoration. The broad restoration goals for this indicator include lowering average water levels in the lake, reducing frequency of extreme high water levels, and decreasing phosphorus inputs. Under those conditions, the distribution and abundance of bulrush and submerged plants are expected to increase. In addition, reducing phosphorus loads from agricultural and urban activities to 40 parts per billion in the pelagic zone (open-water area) will result in the following changes: a decrease in algal blooms; an increase in water clarity; an increase in the spatial extent and biomass of native SAV; and a decrease in the rate of nuisance and exotic plant species expansion along the edge of the littoral zone.

Invasive Exotic Species

Significance and background. Florida is noted, along with Hawaii, California, and Louisiana, as one of the states with the greatest number of invasive non-indigenous species. Approximately one-third of the plant

species in south Florida are exotic, and south Florida has more introduced animals than any other region in the United States. An estimated 26 percent of all mammals, birds, reptiles, amphibians, and fish are exotic. While invasive exotic plants may result in changes in ecological function and structure, they do not provide a measure that relates to the ecosystem's ecological condition except as it pertains to their level of invasion and adverse impacts on the ecosystem and biota. This is an indicator of the status of the spread, spatial distribution, and dominance of invasive exotic species and an indicator of progress (or lack thereof) in the control and management of invasive exotic species. The indications provided by monitoring and assessments of invasive exotic species are an evaluation of the integrity of the natural system and native vegetation.

Factors affecting success. During the past 400 years, Florida has been inundated with many predominantly tropical non-indigenous plants and animals. These waves of introductions accelerated during the twentieth century principally through importations by the ornamental plant and exotic pet industries. Exotic species compete with indigenous species for limited water, prey, and habitat; too often the exotics species outcompete the native. Since exotic species often drive ecological changes that may be irreversible, prevention, early detection, and removal are key to control and management. Monitoring and regular assessment of the spread of existing exotic species and the detection of new potentially invasive species is critical to effective control and management. Trends in the spread and density of invasive exotic plants, as well as the impacts that control and management activities have on their spread and density, will be important to the assessment of management success to control and eradicate invasive species in the Everglades.

Toward restoration. Broad restoration goals for this indicator are a reduction in spatial extent of invasive exotic plant species and populations of invasive exotic animal species in the South Florida Ecosystem. In addition, development of a comprehensive management program would address prevention, maintenance, and management of this condition.

Restoration Compatibility Indicators

Water Volume

Significance and background. A regional volume of water can be evaluated on how well it meets reasonable and beneficial urban and agricultural demands even in drought years. In 1997 Florida established a water supply planning goal to provide water to all existing users during droughts up to the level of severity of a one-in-ten-year frequency of occurrence. This goal has been interpreted to mean at least a 90 percent probability that during any given year all of the needs of reasonable, beneficial water uses will be met while also not causing harm to the water resources and related natural environment.

The C&SF Project was originally designed to provide flood control and deliver water for municipal, industrial, and agricultural uses. Later this was modified to include prevention of saltwater intrusion and provision of adequate water to ENP. The system put in place was an attempt to meet the estimated water needs for a projected population of approximately two million residents by 2000. This population projection was significantly low as the actual population in 2000 was over six million and continues to grow rapidly.

[At the heart of south Florida's interconnected aquatic ecosystem is Lake Okeechobee, a 730 square-mile lake, which provides a number of values and benefits to the state's population, economy, and environment, including environmental, public, and agricultural water supply; flood protection; fisheries; navigation; recreation; and natural habitat for plants and animals.](#)

Factors affecting success. As south Florida’s population increased, so did the demand for water and land, and the subsequent conversion of natural lands to urban and agricultural uses. The result of this conversion was:

- A reduction in the extent of the natural system
- A reduction in water available for the natural system
- Reduced water resources and recharge capability for the aquifer
- Loss of water from the natural and human systems
- Increased needs for flood protection in urban and agricultural areas
- Less water available for the human population
- Conflicts for water between the natural system and people

Under current conditions, canals and levees associated with the C&SF Project have altered the timing and distribution of water across the landscape while the regional flood control and water supply constraints create unnatural surface and groundwater stages (altered volumes) in many areas. [Construction of the protective levee system, along with drainage and development efforts to the south, reduced the natural expanse of the Florida Everglades’ wetland area by 50 percent, constraining flow south from Lake Okeechobee.](#) The CERP is expected to improve the timing, volume, and distribution of water throughout the system primarily by increasing regional storage capacity, removing barriers to flow, and through a careful redistribution of water within the system that more closely matches natural cycles. The CERP’s cumulative objective is to significantly reduce the release of millions of acre-feet of water for flood control by increasing storage capacity and thus increasing the amount of freshwater available to all water users – people as well as the environment – and to meet anticipated water supply needs for the 50 year CERP planning horizon. This retained and stored water is referred to as “new” water.

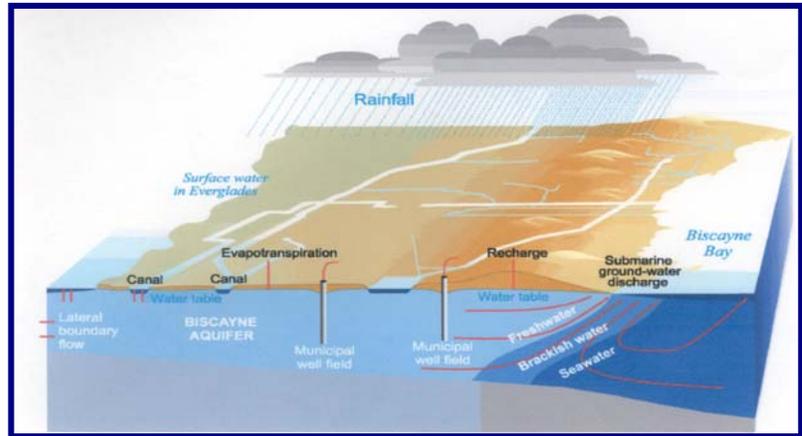
Toward restoration. Broad restoration goals for this indicator are to distribute water across the ecosystem in a manner that reflects natural conditions while providing for the other water-related needs of the region. In addition the water supply planning goal that will support achieving this condition is to provide water to all existing users during droughts up to the level of severity of a one-in-ten-year frequency of occurrence. Though specific targets are being refined the general target is to meet predicted “new” water volume targets (in acre-feet) identified through the C&SF Restudy. Current projections for new water are outlined below.

Targets for “new” water volume		
By 2010	-	931,000 acre-feet of new water
By 2015	-	1,060,000 acre-feet of new water
Full Restoration	-	1,620,000 acre-feet of new water

Biscayne Aquifer Saltwater Intrusion

Significance and background. The Biscayne aquifer underlying southeast Florida provides freshwater resources to both the ecosystem and most of south Florida’s human population. Saltwater intrusion poses a continuing threat to the Biscayne aquifer. In order to restrict the inland migration of the saline interface, a sufficient freshwater head must be consistently maintained within the aquifer. Both the volume and water quality in the aquifer are affected by human activities, including extractions for public and private water services, and pumping and diversion of the freshwater to restoration projects or to sea.

Factors affecting success. Harm to the Biscayne aquifer in terms of saltwater intrusion is considered to be movement of the saltwater interface to a greater distance inland than has occurred historically as a consequence of seasonal water level fluctuations up to and including a one-in-ten-year drought event. Groundwater levels within the Biscayne aquifer are controlled by local rainfall and by the canals and structures that are regionally operated by the SFWMD. The SFWMD implements two programs, canal operations and consumptive use permitting, to prevent increases in movement of saltwater within the Biscayne aquifer.



Conceptual diagram of hydrologic system of south Florida (from Langevin, 2000).

The CERP intends to increase the storage capacity of water in the regional system for delivery to the Lower East Coast Service Area. The increase in regional storage capacity provided by the CERP will supplement regional and local sources used to prevent saltwater intrusion. CERP's water projects that may directly or indirectly affect Biscayne aquifer dynamics include surface and water storage, aquifer storage and recovery (ASR), and modifications to impediments of sheetflow (decompartmentalization).

Toward restoration. The broad restoration goal for this indicator is for the Biscayne aquifer to achieve a level of protection where the movement of the saltwater interface is maintained at no greater distance inland than has occurred historically as a consequence of seasonal water level fluctuations up to and including a one-in-ten-year drought event.

Flood Protection – C-111 Basin

Significance and background. The 1948 C&SF Project was intended to help protect the public living in south Florida from flooding. As population increased the land uses changed, agricultural areas were developed for housing and natural wetlands were developed for agriculture, with increasing pressure to continue this pattern toward the Everglades. As agricultural and residential areas eventually abutted the Everglades a direct conflict related to water levels occurred.

Factors affecting success. The water levels required for the health of Everglades wetlands and aquifer recharge are often not the same as needed for agricultural and developed areas. In south Miami-Dade County, the draining of the developed side of the levy also caused the loss by seepage of water needed for sustenance of natural wetlands and ENP. During dry seasons the C&SF Project moved water into south Miami-Dade County for agriculture and the Everglades, but constant pumping drained even more water from the Everglades, exacerbating the dry conditions. This scenario particularly describes the evolution of flooding challenges in the C-111 Basin that covers approximately 100 square miles in the southernmost portion of Miami-Dade County adjacent to the ENP. The predominant land use in this basin is agricultural, although portions of Florida City and Homestead lie within the basin.

Toward restoration. A goal of Everglades restoration and the CERP is to enhance economic values and social well being by maintaining or enhancing the current level of flood protection while restoring appropriate water levels and hydroperiods in the natural system. By avoiding increased flood damages or mitigating for flood encroachment, increases to project and societal costs can be minimized.

Broad restoration goals for this indicator are to reduce conflict in the water management operations in the C-111 Basin where agricultural lands abut ENP and to achieve a one-in-ten-year level of flood protection for the C-111 Basin.

STRATEGIC GOALS AND OBJECTIVES

The ultimate result of the Task Force member agencies' efforts should be the restoration of the South Florida Ecosystem. The direct measures of success for achieving this result are addressed in the preceding "Vision" section of this *Strategy*.

Because of the complexity and the long time frame of this initiative, it is also important to measure and track the hundreds of activities (*outputs* in the language of performance management) that must be performed to achieve the result of a restored ecosystem. By measuring and tracking the contributions of individual and aggregated work efforts, or projects, the Task Force members can identify whether restoration activities are being implemented in a timely and effective manner.

To this end, the Task Force members have identified three strategic goals, related subgoals, and specific objectives for the work that must be done. The three strategic goals recognize that water, habitats and 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. The subgoals divide the goals into more definitive areas of concern:

- GOAL 1: GET THE WATER RIGHT
 - Subgoal 1-A: Get the hydrology right
 - Subgoal 1-B: Get the water quality right

- GOAL 2: RESTORE, PRESERVE, AND PROTECT NATURAL HABITATS AND SPECIES
 - Subgoal 2-A: Restore, preserve, and protect natural habitats
 - Subgoal 2-B: Control invasive exotic plants and animals

- GOAL 3: FOSTER COMPATIBILITY OF THE BUILT AND NATURAL SYSTEMS
 - Subgoal 3-A: Use and manage land in a manner compatible with ecosystem restoration
 - Subgoal 3-B: Maintain or improve flood protection in a manner compatible with ecosystem restoration
 - Subgoal 3-C: Provide sufficient water resources for built and natural systems

Specific objectives for what must be done in order to achieve these subgoals and goals – and ultimately the intended result of a restored ecosystem – were developed using the best information available gained and obtained through models, outputs, or research findings.

The objectives included in this *Strategy* do not comprise the exhaustive list of everything that needs to be done to restore the South Florida Ecosystem. Rather they provide an overview of the major restoration accomplishments and whether they are proceeding on schedule, which indicates~~indicating~~ whether or not the work of the Task Force member agencies is on track. The objectives, like the projects, are subject to adaptive management and may be modified as new information becomes available or when desired outcomes are not achieved. The Task Force agencies periodically provide updated data to the Task Force, which synthesizes the information for its strategy and biennial reports.

The major projects contributing to each objective are listed in this section of the *Strategy*. If more than one project is required to meet a single objective, then each project's partial contribution is identified. Not all the Task Force projects are listed in this section. However, all are listed in Appendix A and all are described in detail in the IFP project sheets provided in Volume 2.

Goal 1: Get the Water Right

Water is the lifeblood of the South Florida Ecosystem, [supporting many unique habitats, in particular the Everglades portion of this system](#). ~~However, b~~By the year 2000, ~~the historic~~ water flows had been reduced to less than one-third of those [occurring in the historic that had once flowed through the](#) Everglades. The quality of water that ~~did~~ [entered](#) the ecosystem had been seriously degraded. Water did not flow at the same times or durations as it did historically, nor could it move freely through the system. The whole South Florida Ecosystem suffered. The health of Lake Okeechobee was seriously threatened. Many plants and animals that live in south Florida and the Everglades were in danger of becoming extinct because their habitats had been degraded, reduced, or eliminated. 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. Urban and agricultural areas were also adversely affected. Water shortages and water restrictions were occurring more frequently in some parts of south Florida.

Getting the water right must address four interrelated factors: the quantity, quality, timing, and distribution of water. More water is not always better. Alternating periods of flooding and drying were vital to the historical functioning of the Everglades Ecosystem. Getting the water right also must recognize the needs of natural systems, urban and rural communities, and agriculture. Waters need to meet applicable water quality standards, including standards to protect the natural functioning of the Everglades and those that ensure the availability of safe drinking water. The right quantity of water, of the right quality, needs to be delivered to the right places and at the right times.

A consensus-building exercise in 1999 with broad public input identified a list of statements that Task Force participants used as a foundation to develop the Task Force *Strategy*. Based on that consensus, the water will be right when the following conditions are met: Natural hydrologic functions are restored in wetland, [riverine, lacustrine,](#) estuarine, marine, and groundwater systems, while also providing for the water resource needs of urban and agricultural landscapes. Natural variations in water flows and levels are restored without diminishing essential levels of water supply or flood control. Compartmentalization is reduced, and natural patterns of sheet flow are recovered to the maximum extent possible. Water resources accommodate the needs of natural systems, communities, and business. Safe drinking water is available for the people of south Florida. Damage caused to water quality by pollutants and contaminants (such as from agricultural nutrients or urban related pollutants) is eliminated. Water levels and the timing of water deliveries reflect quantities resulting from natural rainfall and are distributed according to natural hydrologic patterns or patterns modified by scientific consensus. Damage to natural and human systems caused by flood and drought is minimized. Groundwater resources are protected from depletion and contamination.

Efforts to achieve goal one must incorporate a process to address concerns of environmental justice and economic equity. The unique cultural and ethnic diversity of south Florida's population, with its strong representation of peoples from all over the world, will require significant efforts on behalf of the restoration partners to ensure that projects are implemented in ways that do not result in disproportionate impacts on any communities. Additional targeted efforts will be required to provide opportunities for socially and economically disadvantaged individuals and small businesses to participate in the implementation of restoration programs and projects. The Task Force and Working Group see this guiding principle as critical to long-term success.

Subgoal 1-A: Get the Hydrology Right (Water Quantity, Timing, and Distribution)

How This Subgoal Will Be Implemented

On average 1.7-8 billion gallons per day (gpd) of water that once flowed through the South Florida Ecosystem is discharged via canals to the ocean or gulf. The CERP and other projects include the following five programs for recapturing most of this water and redirecting it to sustain natural system functioning and to supplement urban and agricultural water supplies.

Surface water storage reservoirs. Surface water storage impoundments and water control structures will allow manipulation of flows in the system to mimic the natural system. A number of water storage facilities are planned north of Lake Okeechobee, in the Caloosahatchee and St. Lucie basins, in the EAA, and in Palm Beach, Broward, and Miami-Dade Counties. These areas will encompass approximately 181,300 acres and will have the capacity to store 1.8 million acre-feet of water. Two rock mining areas in Miami-Dade County will be converted to in-ground storage areas.

Aquifer storage and recovery. Subsurface storage will be used to meet remaining water management goals ~~supply needs~~. The limestone platform that underlies Florida is honeycombed with voids and porous layers of sedimentary rock capable of holding water in storage. Water that currently leaves the ecosystem in canals can be captured, treated, and injected ~~stored into~~ these aquifers, and held ~~in storage~~ until the water is needed to augment surface storage supplies. The CERP envisions that more than 300 wells may be needed ~~will be built~~ to store water 1,000 feet ~~underground~~ in the upper Floridan aquifer. Pilot testing of this approach is ongoing in different geologic areas ~~is ongoing~~. Although ASR technology has been used successfully in Florida since 1983, concerns have been expressed about the proposed use of large-scale ASR in south Florida at the regional scale proposed in the CERP. Many of these concerns were outlined in a 1999 report prepared by the ASR Issue Team of the Task Force.

To address concerns about ASR, an interagency study team led by the USACE and SFWMD was formed in 2000 and included ~~is made up of~~ representatives from the U.S. Geological Survey, U.S. Environmental Protection Agency (USEPA), Task Force, the Florida Department of Environmental Protection (DEP), Florida Geological Survey, Florida Department of Health, and various local governments. The interagency study team was tasked with preparing Project Management Plans (PMPs) and overseeing the implementation ~~on of~~ the three ASR Pilot-pilot Projects ~~projects~~. In 2001, an independent scientific review panel of the National Academies of Science and the Committee for the Restoration of the Greater Everglades Ecosystem (CROGEE) reviewed the draft PMPs for two ASR Pilot-pilot Projects ~~projects~~ and subsequently issued a report that recommended additional research. The ASR Regional Study was designed to answer many of the questions concerning the feasibility of full-scale ASR implementation. CROGEE subsequently reviewed the PMP for the ASR Regional Study. The PMP was approved and the ASR Regional Study has been ~~initiated~~ the to ~~collection of~~ regional hydrogeologic and water quality data, and developed a regional groundwater model as well as other tools required to address regional scale technical uncertainties.

If proven successful, wells will ~~may~~ be located around Lake Okeechobee, in the Caloosahatchee Basin, and along the east coast. As much as 1.5-7 billion gallons a day may be pumped down the wells into underground storage zones for subsequent recovery. ASR has advantages over surface storage ~~B~~ because water does not evaporate ~~evaporation does not occur when water is~~ ~~when~~ stored underground and significantly less land is required than is needed for a surface reservoir for storage, ~~ASR has some advantages over surface storage~~. In particular, water stored in the aquifer can be made available through multiple ~~for longer durations in~~ years of severe drought conditions. The stored water will be pumped into the existing surface water delivery system to meet environmental, urban, and agricultural water supply demands. ASR components represented approximately one-fifth of the total CERP costs presented in the 1999 C&SF Restudy.

Removal of barriers to sheetflow. Canals, internal levees, and other impediments will be removed or modified to reestablish the natural sheetflow of water through the system. The Kissimmee River Restoration Project will restore approximately 40 square miles of free-flowing river floodplain and associated wetlands, which likely will help improve the quality of water flowing into Lake Okeechobee. The Modified Water Deliveries to ENP and Canal-111 projects will restore historic hydrological patterns to the Everglades. In the CERP, many of the internal levees and most of the Miami Canal in WCA-3 will be removed, and 20 miles of the Tamiami Trail (U.S. Route 41) will be rebuilt with bridges and culverts, allowing water to flow more naturally into ENP. In the Big Cypress National Preserve, the levee that separates the preserve from WCA-3A will be removed to restore more natural overland water flow.

Seepage management. Millions of gallons of groundwater are lost each year as it seeps away from the Everglades towards the east coast, where groundwater levels were lowered by the C&SF Project to allow for development and all human uses. Seepage generally occurs either as underground flow or through levees (the artificial boundaries of the natural system). Three kinds of projects will reduce unwanted water loss and redirect this flow westward to the WCAs, ENP, and northeast Shark River Slough: (1) adding impervious barriers to the levees to block loss of water; (2) installing pumps near levees to redirect water back into the Everglades; and (3) holding water levels higher in undeveloped areas east of the protective levee between the Everglades and Palm Beach, Broward, and Miami-Dade Counties.

Operational changes. Changes in water delivery schedules will be made in some areas to alleviate extreme fluctuations. Lake Okeechobee water levels will be modified to improve the health of the lake. In other areas, rainfall-driven operational plans will enhance the timing of water flows. Water will be delivered, as facilities are constructed, according to schedules that match natural hydrological patterns as closely as possible. Continued research will improve understanding of the hydrology and how it can be restored while maintaining urban and agricultural water supply and flood control. All efforts in CERP to restore the ecosystem incorporate reviews required by the assurance language of WRDA 2000 (attached as [Appendix X](#)) to ensure that existing legal sources of water are not eliminated or transferred until a new source of water supply of comparable quality and quantity is available.

Long-Term Operations and Maintenance Needs

Effective management of water storage and delivery will require close coordination between the USACE and the SFWMD. Project sponsors will constantly monitor in-place storage and water flows to ensure that the storage and recovery systems are functioning properly. Wells, wellheads, and pumps will require regular maintenance to operate effectively, and long-term operating plans will be developed to ensure continued service.

Factors Affecting Achievement of this Subgoal

Population growth. The population of south Florida is expected to double by 2050, greatly increasing demands on water. Urban water supply demands could increase from approximately one [to two billion gallons per day \(gpd\)](#) ~~to two billion gpd~~, taxing the limited natural and economic resources of the Task Force participants.

Funding. A critical factor is stable and reliable funding for the timely completion of these projects. If the hydrology projects cannot be completed on schedule, the effects can cascade through the restoration effort, blocking successful completion of the water quality subgoal and delaying the habitat restoration and preservation subgoals. Delays can increase costs over the long term and, in some cases, foreclose land acquisition options, thus creating further delays or requiring project design modifications. Increasing demands on the limited natural and financial resources of the Task Force members may affect their ability to achieve their strategic goals. However, the State of Florida has committed to the expedited completion of several projects within this subgoal area through the 2004 initiation of the Acceler8 program.

Land acquisition. Many of the surface storage impoundments will be constructed on lands that have yet to be acquired. In some cases, easements are needed for impoundments and/or canals to connect an impoundment to the system. Willingness of landowners to sell land, funds to exercise land acquisition options, and community acceptance of projects are factors that can affect completion of the objective.

Natural disasters. Severe weather, including *el Niño* and *la Niña* cycles, and natural disasters, such as hurricanes and forest fires, could delay completion of the restoration activities. Impoundment dikes are particularly susceptible to severe rainstorm damage during and immediately after construction. Careful construction can minimize but not eliminate project setbacks and delays due to weather events, such as hurricanes and tropical storms. Extreme weather conditions may also affect the ability to manage and maintain aquifer water storage, given the complexity of the limestone geology of Florida.

Technical Uncertainties. Although aquifer storage and recovery technology has been used for many years there are some technical uncertainties of using this technology on such a large scale. These uncertainties are being thoroughly researched through ASR pilot projects and a Regional ASR Study. In addition, an ASR Contingency Plan is being developed to identify storage and water supply options should implementation of ASR at the scale envisioned in CERP not be possible. There is similar uncertainty associated with in-ground storage and seepage management, which the CERP pilot projects will address.

Specific, Measurable Objectives for Achieving this Subgoal

Three objectives for achieving this subgoal have been adopted by the Task Force:

- Provide 1.8 million acre-feet of surface water storage by 2036
- Develop ~~alternative water storage~~ ~~aquifer storage and recovery~~ systems capable of storing 1.5-7 billion gallons per day by 2030
- Modify ~~345-361~~ miles of impediments to flow by 2020

The key projects needed to achieve these objectives and the schedule for their implementation are shown in Strategic Plan Table 3.

Strategic Plan Table 3 – Subgoal 1-A: Get the Hydrology Right

1-A Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.) <i>* Some projects have been combined or split with/from others since 2007</i>			
Objective 1-A.1: Provide 1.8 million acre-feet of surface water storage by 2036	Project ID	Restoration Endpoint	Project
	1101	2019	C&SF: CERP Indian River Lagoon- South, (C-23/C-24/C-25/Northfork and Southfork Storage Reservoirs, and C-44 Basin Storage Reservoir) (CERP Project WBS #07)
	1102	2015	C&SF: CERP Everglades Agricultural Area (EAA) Storage Reservoir (CERP Projects WBS# 08)*
	1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS # 01)
	1105	2036	C&SF: CERP North Lake Belt Storage Area (CERP Project WBS # 25)
	1106	2017	C&SF: CERP Palm Beach County Agricultural Reserve Reservoir – Part 1 (CERP Projects WBS# 20)
	1107	2013	C&SF: CERP Site 1 Impoundment (CERP Project WBS# 40)
	1109	2013	C&SF: CERP C-43 Basin Storage Reservoir --Part 1 (Caloosahatchee River (C-43) West Basin Storage Reservoir Caloosahatchee Watershed) (CERP Project WBS# 04)

	1110	2036	C&SF: CERP Central Lake Belt Storage Area (CERP Project WBS # 26)
	1111	TBD	E& SF: Critical Projects - Ten Mile Creek
	1112	2015	Taylor Creek Reservoir – Expedited Project – The SFWMD is implementing as part of Northern Everglades Project
	1113	2014	C&SF: CERP – Water Preserve Area Conveyance (CERP Project WBS# 49)
	1114	2017	C&SF: CERP Everglades National Park Seepage Management (CERP Projects WBS #27 and 43)
	1115	2015	C&SF: CERP North Palm Beach County PIR- Part 1 (CERP Project WBS #17) (Formerly Project ID 1503)
	1116	2017	C&SF: CERP Broward County WPAs (Broward County WPA - C-9 Stormwater Treatment Area/Impoundment and Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management) (Formerly Project ID 1501) (CERP Project WBS# 45)
	2100	TBD	Allapattah Ranch
Objective 1-A.2: Develop alternative water storage systems capable of storing 1.5-7billion gallons per day by 2030	Project ID	Restoration Endpoint	Project
	1200	2019	C&SF: CERP North Palm Beach County – Part 2 (CERP Project WBS #18)
	1201	2027	C&SF: CERP Lake Okeechobee ASR (CERP Project WBS# 03)
	1202	2024	C&SF: CERP Hillsboro ASR Phase 2 (CERP Project WBS# 22)
	1203	2017	C&SF: CERP ASR Regional Study
	1204	2020	C&SF: CERP PBC Agriculture Reserve Aquifer Storage & Recovery -- Part 2 (CERP Project WBS# 21)
	1205	2019	C&SF: CERP C-43 Basin- Aquifer Storage and Recovery (ASR)-- Part 2 Caloosahatchee River Aquifer Storage and Recharge (C43-ASR) (CERP Project WBS #05)
Objective 1-A.3: Modify 345-361 Miles of impediments to flow by 2020	Project ID	Restoration Endpoint	Project
	1300	2014	C&SF C- 111 (South Dade)
	1301	2019	C&SF: CERP WCA-3 Decompartmentalization and Sheetflow Enhancement (CERP Projects WBS # 12, 13, and 47)
	1302	2018	C&SF: CERP Florida Keys Tidal Restoration (CERP Project WBS # 31)
	1303	2015	E&SF Critical Projects- Southern CREW
	1306	2013	Kissimmee River Restoration Project
	1307	2013	Modified Water Deliveries to Everglades National Park
	2003	2011	Critical Projects: Tamiami Trail Culverts (Formerly Project ID 1400)
	Completed Projects		
	1304	2007	East WCA-3A Hydropattern Restoration
	1305	1997	Kissimmee Prairie

Subgoal 1-B: Get the Water Quality Right

Runoff from agriculture and stormwater from urban areas has polluted 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 pollution problem. The water quality of the Caloosahatchee River, St. Lucie Estuary, Biscayne Bay, Florida Bay, the Florida Keys, and the nearshore waters off the coasts periodically show signs of significant degradation, including eutrophication, excessive salinity range, and short-term variability and introduction of anthropogenic agricultural or industrial pollutants. In marine systems, exogenous nitrogen appears to be of particular concern. Mercury is also a concern in both freshwater and marine systems in south Florida. Potentially toxic contaminants, such as trace metals, pesticides and other

synthetic organic chemicals, and emerging pollutants of concern (EPOCs), which occur in wastewater, certain soils and sediments, may occur in alternative sources of water or be present in former agriculture sites that are used in connection with restoration.

The Task Force is committed to working with the relevant federal, state, and local agencies to ensure that water quality problems like coastal eutrophication are not exacerbated by the altered water management and delivery achieved through CERP and other projects.

How This Subgoal Will Be Implemented

Everglades Forever Act. In 1994 the Florida Legislature passed the Everglades Forever Act (EFA), which codified measures to improve water quality within the Everglades Protection Area (EPA), defined as the Loxahatchee NWR, WCAs 2 and 3, and ENP⁷. One provision establishes the Everglades Construction Project, a set of six stormwater treatment areas (STAs) between the EAA and the natural areas to the south. The main purpose of these treatment areas is to reduce the phosphorus loads in waters entering the EPA. Additionally, the state uses regulatory programs and landowners implement best management practices to reduce phosphorus from urban and agricultural discharges. These programs and practices have reduced the phosphorus levels discharged from the EAA and neighboring basins into the Everglades. However, the final standards have not yet been met. A plan of construction projects, source controls, and continuing scientific investigations has been developed by the SFWMD to ensure that discharges from all basins impacting the Everglades meet state water quality standards. This plan is referred to as the Long-Term Plan.

In March 2003 the SFWMD presented a conceptual plan for achieving long-term water quality goals, the district strategy for meeting water quality standards. During the 2003 legislative session, the Everglades Forever Act was amended to include reference to the SFWMD Long-Term Plan as the Best Available Phosphorus Reduction Technology. The amended act required the SFWMD to implement the Long-Term Plan without delay. In July 2003 the DEP proposed a rule establishing a long-term geometric mean of 10 ppb with associated natural variability as the numeric phosphorus criterion for class III waters in the EPA. The rule also establishes moderating provisions for permits authorizing discharges into the EPA in compliance with water quality standards, including the numeric phosphorus criterion and a method for determining achievement of the numeric phosphorus criterion. The rule also establishes moderating provisions authorizing discharges above the criterion, provided measures are taken to implement the best available phosphorus reduction technologies, and a compliance methodology for determining achievement of the criterion. The rule was approved by the USEPA in July 2005.

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 phosphorus standard applies to class III-A waters within tribal boundaries, defined by the tribe as tribal water bodies used for "fishing, frogging, recreation (including air boating), and the propagation and maintenance of a healthy, well-balanced population of fish and other aquatic life and wildlife...primarily designated for preservation of native plants and animals of the natural South Florida Ecosystem." While tribal waters on the Federal Reservation are located in the area of the Everglades which has median background total phosphorus concentrations ranging from 4 to 10 µg/l (often lower than the standard), the USEPA determined that at present no data suggest that phosphorus concentrations less than or equal to 10 µg /l

⁷ See Appendix C Additional View of the Miccosukee Tribe "Putting the Everglades back into Everglades Restoration." Section II.A.

cause changes in flora or fauna. Citing peer reviewed publications and technical reports, the USEPA determined that the 10 µg/l standard was a "scientifically defensible value which is not overly protective" and will protect the class III-A designated use. It also states, however, that additional Everglades data are still being collected, and if further studies show that 10 µg/l is not protective of class III-A waters, then the tribe should revise its standard as necessary.

Best Management Practices. The Natural Resources Conservation Service (NRCS) provides technical assistance on a voluntary basis to private landowners and operators, Indian Tribes, and others for the planning of conservation practices and installation of needed conservation management systems with the goal of achieving natural resource sustainability. Participants associated with animal feeding, livestock grazing operations, and fruit and crop production within the South Florida Ecosystem are helped to implement practices that improve nutrient management, water quality, and water conservation. The Environmental Quality Incentives Program provides farmers and ranchers financial and technical assistance to install or implement structural and management practices on agricultural lands that will improve or maintain the health of natural resources in the area including water quality. [In addition, the State of Florida implements numerous urban and agricultural BMP programs including cost-sharing and incentive based programs.](#)

Water management plans. Monitoring and research will be required before outlining additional plans for improving water quality in south Florida's lakes, wetlands, estuaries, and bays. Consequently, not all the projects and outputs needed to achieve this subgoal have been identified.

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. For those waters deemed impaired, the DEP, in conjunction with the SFWMD, the Florida Department of Agriculture and Consumer Services (DACCS), and other appropriate entities, will develop TMDLs. The TMDL will establish the maximum amount of a pollutant that a water body can assimilate without impairing the designated use.

The state's watershed management program is based on a five-phase cycle. During the first phase, the water quality data for each basin are assessed and waters determined to be potentially impaired are identified. In phase two, intensive monitoring is conducted to supply data needed to either verify a suspected impairment or (in cases where the impairment has previously been verified) to model the impaired waters and generate TMDLs. During the third phase, TMDLs for impaired waters are calculated and allocated to individual point sources and the major categories of nonpoint sources. After TMDLs are adopted, a consensus-based basin management action plan, which includes a TMDL implementation plan, is developed during the fourth phase. The fifth and final phase involves the implementation of the proposed management plan, including securing funding, passing local or state legislation, and writing permits that reflect the limits of the TMDLs. Implementation of TMDLs may involve any combination of regulatory, nonregulatory, or incentive-based actions that attain the necessary reduction in pollutant loading. Nonregulatory or incentive-based actions may include development and implementation of best management practices, pollution prevention activities, and habitat preservation or restoration.

Regulatory actions may include issuance or revision of wastewater, stormwater, [works of the district, or](#) environmental resource permits to include permit conditions consistent with the TMDL⁸. Once these

⁸ See Appendix C Additional View of the Miccosukee Tribe "Putting the Everglades back into Everglades Restoration." Section II.A.5.

plans have been adopted and implemented, progress is monitored until waters are eventually certified as meeting water quality standards.

The DEP provides annual updates to the 303(d) list. Any new water bodies identified as being impaired by pollutants will be added to the list and given a priority for TMDL development, normally as part of the next five-year cycle. In addition, each existing TMDL will be reevaluated as part of the next five-year cycle to determine progress toward meeting water quality standards and whether the TMDL needs to be revised.

Lake Okeechobee Protection Program. The Lake Okeechobee Protection Act (LOPA) commits the State of Florida to restore and protect Lake Okeechobee. This will be accomplished by achieving and maintaining compliance with water quality standards in the lake and its tributary waters. The approach is a watershed based, phased, comprehensive, and innovative protection program designed to reduce phosphorus loads and implement long-term solutions based upon the TMDL for Lake Okeechobee developed by the DEP. This TMDL is a long term (five year) rolling average of 140 metric tons (mt) to be attained by 2015. The TMDL consists of 105 mt yr⁻¹ from the watershed and 35 mt yr⁻¹ from atmospheric deposition. Atmospheric deposition is defined as both wet and dry fall input directly to the lake. The LOPA also requires aggressive programs to control exotic plants and a long-term program of water quality and ecological assessment, research, and predictive model development.

Elements of the program include (1) the Lake Okeechobee Protection Plan (LOPP), (2) the Lake Okeechobee Construction Project, (3) the Watershed Phosphorus Control Program, (4) the Research and Water Quality Monitoring Program, (5) the Internal Phosphorus Management Program, (6) the Exotic Species Control Plan, and (7) an Annual Progress Report. The SFWMD, in cooperation with DEP and DACS, developed the LOPP, which was submitted to the Florida Legislature on January 1, 2004. The LOPP describes in detail how water quality standards, particularly for phosphorus, will be met in Lake Okeechobee and its downstream receiving waters by 2015. The watershed phosphorus control program uses a multifaceted approach to reduce phosphorus loads through continued implementation of existing regulations and BMPs, development and implementation of improved BMPs, improvement and restoration of the hydrologic functions of the natural and managed systems, and use of alternative technologies for nutrient reduction. Projects are being implemented in a cooperative manner by the SFWMD, DEP, and DACS.

Considerable progress has been made to control the spread of exotic plants in the lake, watershed projects have been implemented to reduce phosphorus transport from agricultural lands and capture runoff water during high rainfall periods, and modifications to the lake regulation schedule are under consideration. Because of the complex nature and long history of problems, full implementation of the LOPA will require more than a decade, and improvements in lake water quality are expected to be slowed by internal nutrient recycling. Ongoing research in the watershed is helping to optimize the design of phosphorus reduction/flow attenuation measures, and research in the lake is providing guidance for adaptive management of water levels and exotic plants. Restoration of water quality and ecosystem functions in Lake Okeechobee is critical to south Florida because the lake is the central part of both the natural and man-made regional aquatic system.

Lake Okeechobee Estuary Recovery Plan. The Lake Okeechobee Estuary Recovery Plan (LOER) identifies five construction projects north of Lake Okeechobee that were specifically designed for water quality improvement as the Lake Okeechobee Fast Track Projects (LOFT). The projects that have been fast tracked include Nubbin Slough STA expansion, Taylor Creek Reservoir, Lakeside Ranch STA, and rerouting runoff from the S-133 and S-154 basins to the Lakeside Ranch STA. In addition to the LOFT projects, LOER includes acceleration of TMDL development for Lake Okeechobee tributaries; implementation of mandatory fertilizer BMPs in the Lake Okeechobee, St. Lucie Estuary, and Caloosahatchee Estuary watersheds; implementation of revised Environmental Resource Permit criteria

~~for new development; implementation of growth management programs encouraging innovative land use; elimination of land application of wastewater treatment residuals, and full implementation of the LOPP.~~

Northern Everglades and Estuaries Protection Program

In 2007, the Florida legislature enacted the Northern Everglades Initiative (Senate Bill 392). The Act expands the Lake Okeechobee Protection Act to the entire Northern Everglades system, including the Lake Okeechobee watershed as well as the Caloosahatchee and St. Lucie rivers and estuaries. Over the next two years, the law calls for the development of far-reaching plans to protect and improve the quality, quantity, timing and distribution of water north of Lake Okeechobee and in the Caloosahatchee and St. Lucie River watersheds. These plans will augment and enhance restoration currently underway in the Everglades south of the lake and build upon ongoing restoration efforts north of Lake Okeechobee. The revised legislation requires the SFWMD, in collaboration with coordinating agencies (DEP and DACS) to develop and implement Protection Plans for the Lake Okeechobee, St. Lucie, and Caloosahatchee Watersheds. The approach is to develop watershed-based, phased, comprehensive, and innovative protection programs designed to reduce nutrient loads and implement long-term solutions based upon the TMDLs developed by the DEP. Elements of the protection programs include: 1) Watershed Construction Projects, 2) Pollutant Control Programs, and 3) Research and Water Quality Monitoring Program. The SFWMD, in cooperation with DEP and DACS are responsible for development of the Protection Plans.

The Pollutant Control Programs will use a multifaceted approach to reduce nutrient loads through continued implementation and expansion of urban and agricultural BMPs, research and optimization of BMPs, more stringent regulatory programs, improvement and restoration of the hydrologic functions of the natural and managed systems, and use of alternative technologies for nutrient reduction. Projects are being implemented in a cooperative manner by the SFWMD, DEP, and DACS.

The Watershed Construction Projects will identify water quality projects that contribute to achievement of TMDLs. The Lake Okeechobee Protection Plan has identified STAs as a critical feature necessary for water quality improvement and is expediting the Lakeside Ranch STA in order to achieve early benefits. Additional STAs will be incorporated into the Protection Plans for the St. Lucie and Caloosahatchee watersheds as the plans are developed. Other stormwater and wastewater treatment projects (e.g., stormwater retrofits, sewer to septic conversions) will be incorporated into the plans as appropriate.

Florida Keys National Marine Sanctuary Water Quality Protection Program. The USEPA and the DEP conduct a comprehensive water quality monitoring and research program aimed at correcting point and nonpoint sources of water pollution within the Florida Keys National Marine Sanctuary (FKNMS). The Water Quality Protection Program, initiated in 1996, is the first such program developed for a national marine sanctuary. All state waters within the sanctuary boundary were designated a no-discharge zone in 2002.

Comprehensive Integrated Water Quality Feasibility Study. The USACE and the DEP developed a PMP for the Comprehensive Integrated Water Quality Feasibility Study in February 2004 and are currently coordinating a draft design agreement. The study is consistent with the goals and purposes of CERP and will:

- Identify links between water quality and ecosystem functions
- Identify degraded ecosystems and quantify the types and sources of pollution
- Develop targets for ecosystem restoration
- Inventory and evaluate a suite of structural and other measures capable of improving water quality
- Integrate planned and existing water quality restoration and management programs with CERP projects and with other federal, state, tribal, and local programs and projects

- Recommend additional programs and projects needed to achieve ecosystem restoration
- Identify appropriate funding sources

The study area encompasses approximately 17,500 square miles from Orlando to the Florida Reef Tract. The Kissimmee River, Lake Okeechobee, and the Everglades are the dominant watersheds included in the study area connecting a mosaic of wetlands, uplands, coastal systems, and marine areas within all or portions of 19 counties.

In 2006, The Task Force ~~urges~~urged the USACE and other agencies to undertake and complete the Comprehensive Water Quality Feasibility Study for the restoration of the Florida Everglades⁹.

Factors Affecting Achievement of the Subgoal

Natural disasters. Severe weather, including *el Niño* and *la Niña* cycles, and natural disasters, such as hurricanes and forest fires, will adversely affect water quality.

Land acquisition. Many of the stormwater treatment areas will be constructed on lands that have yet to be acquired. Willing land sellers, funds to exercise land acquisition options, and community acceptance of projects are factors that can affect completion of the objective.

Funding. Funding is always a critical factor. If the water quality projects cannot be completed on schedule, the effects can cascade through the restoration effort, delaying progress toward meeting the habitat restoration and preservation subgoals. Although Acceler8 is primarily focused on water storage, a few water quality projects are also being funded and expedited through this program.

Specific, Measurable Objectives for Achieving this Subgoal

Two objectives for achieving this subgoal have been adopted by the Task Force:

- Construct ~~91,345~~96,010 acres of stormwater treatment areas by 2035
- Prepare locally-based plans to reduce pollutants as determined necessary by the TMDL by 2011

The key projects needed to achieve these objectives and the schedule for their implementation is shown in Strategic Plan Table 4.

⁹ See Appendix C Additional View of the Miccosukee Tribe “Putting the Everglades back into Everglades Restoration.” Section II.A.7.

Strategic Plan Table 4 – Subgoal 1-B: Get the Water Quality Right

1-B Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)				
Objective 1-B.1: Construct <u>91,345,96,010</u> acres of stormwater treatment areas by 2035	Project ID	Restoration Endpoint	Project	
	1500	2019	C&SF: CERP Big Cypress/L-28 Interceptor Modifications (CERP Project WBS #10)	
	1502	2016	C&SF: CERP Miccosukee Tribe Water Management Plan (CERP Project WBS# 90)	
	1505	2018	C&SF: CERP Caloosahatchee Backpumping with Stormwater Treatment (CERP Project WBS# 06)	
	1506	2009	E & SF: Critical Projects Lake Okeechobee Water Retention/Phosphorus Removal	
	1513	2013	C&SF: West Palm Beach Canal STA-1E / C-51 West	
	1514A	2011	State Expedited project includes Agricultural Area (EAA) Stormwater Treatment Areas (STAs) Expansion	
	1515	2012	Lakeside Ranch STA - expedited project (project feature of the Lake Okeechobee Watershed Construction Project Phase II Technical Plan	
	1518	2018	C&SF: CERP Henderson Creek/Belle Meade Restoration (CERP Project WBS #93)	
	1519	2012	C-43 Water Quality Treatment Area	
	1101	2023	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 (CERP Project WBS# 07)	
	1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS #01)	
	1110	2036	C&SF: CERP Central Lake Belt Storage Area (CERP Project WBS# 26)	
	1115	2015	C&SF: CERP North Palm Beach County - Part 1 (CERP Project WBS# 17) (Formerly Project ID 1503)	
	Completed Projects			
	1508	2000	STA-1 West Works and Outflow Pump Station (G-310)	
	1509	2000	STA-2 Works and Outflow Pump Station (G-335)	
	1510	2005	STA-3/4 Works	
	1511	2005	STA-5 Works	
	1512	2006	STA-6 (includes sections 1 and 2)	
1516	2007	Nubbin Slough STA Expansion - expedited project		
Objective 1-B.2: Prepare locally-based plans to reduce pollutants as determined necessary by the TMDL by 2011	Project ID	Restoration Endpoint	Project	
	1600	2011	Total Maximum Daily Load (TMDL) for south Florida	

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

Before European settlement 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.

By the year 2000, the Florida panther and sixty-eight other animal or plant species were 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. Altered biological communities are being overrun by invasive exotic plants and animals capable of outcompeting native species and habitats. By the year 2000, exotic plants made up approximately one-third of the total plant species known in Florida. At that time, the Florida Exotic Pest Plant Council identified 125 of these as serious risks to Florida's natural areas and its threatened and endangered native plants and animals.

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. The original Everglades and other south Florida environments formed hydrologically integrated systems from boundary to boundary. 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. Then it will require time for native plants and animals to reestablish populations and communities. The intended result will be self-sustaining populations of diverse native animal and plant species. This must take into account that populations that have adapted to current conditions may be impacted.

A consensus-building exercise in 1999 with broad public input identified a list of statements that Task Force participants used as a foundation to develop the Task Force *Strategy*. Based on that consensus, the habitats will be restored, preserved, and protected when the following conditions are met: The diversity, abundance, and behavior of native south Florida animals and plants and their terrestrial and aquatic habitats are characteristic of pre-drainage conditions. The spatial extent of wetlands and other natural systems is sufficient to support the historic functions of the greater Everglades ecosystem. Important wildlife corridors are identified, enhanced, and preserved. Endangered and other federal and state listed species recover self-sustaining levels, and sufficient habitats for maintaining healthy numbers are restored and protected. Invasive exotic plant and animal species are substantially eliminated or reduced to manageable levels.

Efforts to achieve goal two must incorporate a process to address concerns of environmental justice and economic equity. The unique cultural and ethnic diversity of south Florida's population, with its strong representation of peoples from all over the world, will require significant efforts on behalf of the restoration partners to ensure that projects are implemented in ways that do not result in disproportionate impacts on any communities. Additional targeted efforts will be required to provide opportunities for socially and economically disadvantaged individuals and small businesses to

participate in the implementation of restoration programs and projects. The Task Force and Working Group see this guiding principle as critical to long-term success.

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

How This Subgoal Will Be Implemented

Land acquisition. Land acquisition is critical to South Florida Ecosystem restoration efforts. Land is needed to preserve habitat for native plants and animals and to act as a buffer to existing natural areas. Land is also needed for water quality treatment areas, water storage reservoirs, and aquifer recharge areas that will help restore natural hydrology. Federal, state, and local governments have all played important roles in land acquisition. The most efficient use of resources may not be fee simple purchase of land, nor is it always desirable. Many alternative tools to meet restoration land use needs are being implemented to maximize the benefits of ~~these~~ limited resources. The Task Force supports the use of less than fee acquisitions or the use of other tools. Some examples of the tools being used include:

- Easements
- Temporary lease agreements
- Mitigation banks
- Public private partnerships

Over the past several decades, the federal government has acquired title to lands for conservation and public enjoyment of national parks, preserves, and wildlife refuges. Using existing land use plans and priorities, and based upon the availability of annual appropriations, federal land managers will continue to acquire lands within authorized boundaries of existing national wildlife refuges, parks, and preserves in the South Florida Ecosystem. The completion of these areas will provide additional habitat for threatened, endangered, and other species, as well as recreational opportunities for the people of south Florida and visitors from around the world. The federal government also has provided financial support to state land acquisition programs, such as the \$200 million provided by the 1996 Farm Bill for acquisition in support of ecosystem restoration. Based upon the availability of annual appropriations, federal land managers will continue to look for opportunities to assist the State of Florida in preserving the highest priority areas for implementation of the CERP.

The Florida Forever Program is Florida's primary land acquisition program. The 10 year program, passed in 1999 as an extension of the successful Florida Preservation 2000 Act, will raise approximately \$3 billion (\$300 million per year) for land acquisition. The program identifies and acquires lands from voluntary sellers through a process described under Chapters 259 and 373 of the Florida Statutes. The Florida Legislature is continuing the Florida Forever Program which is set to expire in 2010. The state also partners with local governments and other entities to identify and jointly acquire conservation lands. All of the state laws governing the acquisition of land with public funds for the purposes of conservation, recreation, or fish and wildlife management ensure that the public will be provided access consistent with the rights acquired and use compatible with the purpose for which the land was purchased.

In recent years local governments have initiated, voted, and approved land acquisition programs for hundreds of millions of dollars that are helping to protect and restore the South Florida Ecosystem. Interest is growing for many counties to undertake similar initiatives. These programs have the potential to complement and support the CERP as well as to foster compatibility of the built and natural systems.

State Florida Forever lands, federal parks and preserves, state water preserve areas, county and private conservation lands, conservation easements and other agreements with private landowners, and other lands acquired for South Florida Ecosystem restoration will help expand and connect a mosaic of upland,

wetland, coastal, and marine habitats that will support the recovery of many currently imperiled species. These lands also provide opportunities for water supply enhancement, natural-resource based outdoor recreation, and environmental awareness and education for the state's residents and visitors.

Protection of ~~critical~~ habitat for threatened and endangered species. As part of the South Florida Ecosystem restoration initiative, in 1995 the FWS was directed to prepare a comprehensive, ecosystem-wide strategy to recover threatened and endangered species and to restore and maintain the extremely high biodiversity of native plants and animals in the upland, wetland, estuarine, and marine communities of the South Florida Ecosystem. This extensive effort is known as the [South Florida](#) Multi-Species Recovery Plan (MSRP).

The MSRP addresses the recovery needs of south Florida's federally listed threatened and endangered species. As of ~~2000~~2008, there were sixty-~~nine-eight~~ federally listed threatened and endangered species within the South Florida Ecosystem. A major section of that plan describes 23 of the natural ~~vegetative~~ communities in south Florida and identifies management actions needed to restore the South Florida Ecosystem. Protecting ~~critical~~ habitat for threatened and endangered species will involve ~~significant cooperation and major coordination among the FWS and their many partners, including between the aggressive land acquisition programs of by the state State, the FWS's and the land acquisition plans for the national National wildlife Wildlife refuge Refuge system System and the national National park Park system System of lands. The Task Force has appointed a Multi Species/Ecosystem Recovery Implementation Team (MERIT) to prioritize actions included in the recovery plan.~~

Wetlands enhancement. The CERP calls for removing barriers to sheetflow, restoring more natural hydroperiods 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. Habitat heterogeneity will also be improved as upland and transitional areas experience more natural hydroperiods. Modeling of CERP project components shows that almost 2.4 million acres will be restored and enhanced.

Wetlands enhancement is also achieved through the Wetlands Reserve Program, a voluntary conservation program funded by the Farm Bill through which the U.S. Department of Agriculture (USDA) provides incentive payments and cost-sharing to restore, enhance, and protect degraded wetlands on agricultural lands.

Restoration and preservation of coral reefs. Other major efforts to restore and preserve habitat involve the designation of an ecological reserve and a research natural area to protect critical coral reef communities in the western portion of the FKNMS and Dry Tortugas National Park. The Tortugas region in the Straits of Florida has near-pristine marine resources, including one of the best-developed tropical coral reef systems on the continent. It is the epicenter of marine productivity for the region. Ensuring its long-term protection and appropriate public use will require cooperation among multiple and overlapping jurisdictions, including the U.S. Department of Commerce, the U.S. Department of the Interior (DOI), and the State of Florida.

The FKNMS's Tortugas Ecological Reserve fully protects 151 square nautical miles of coral reefs and associated communities. The Dry Tortugas National Park's research natural area protects an additional 46 nautical miles of reefs and marine habitats. Combined, these two areas encompass 197 square nautical miles, protecting more than 10 percent of the coral reefs in the Florida Keys. Reefs in Biscayne National Park are also protected, and reefs in state parks and other portions of the FKNMS are managed for conservation.

Factors Affecting Achievement of this Objective

Progress in acquiring lands needed for habitat protection will depend upon the availability of land from willing sellers, land values, the rate of development, and annual federal and state legislative appropriations. [National water resources policy for ecosystem restoration also generally limits land acquisition costs to approximately 25 percent of total project costs; however, Congress may consider exceptions to that policy for an individual project based on an analysis of overall benefits to the ecosystem.](#)

Specific, Measurable Objectives for Achieving this Subgoal

Three objectives for achieving this subgoal have been adopted by the Task Force:

- Complete acquisition of 5.78 million acres of land identified for habitat protection by [2015-2020](#)
- Protect 20 percent of the coral reefs by 2010
- Improve habitat quality for 2.4 million acres of natural areas in south Florida

The key projects needed to achieve these objectives and the schedule for their implementation are shown in Strategic Plan Table 5.

Strategic Plan Table 5 – Subgoal 2-A: Restore, Preserve, and Protect Natural Habitats

2-A Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
Objective 2-A.1: Complete acquisition of 5.7 million acres of land identified for habitat protection by 2020	Project ID	Project Endpoint	Project Name
		STATE/SFWMD PROJECTS	
	2100		Allapattah Flats/Ranch
	2101		Atlantic Ridge Ecosystem
	2104		Belle Meade
	2105		Big Bend Swamp/Holopaw Ranch
	2106		Biscayne Coastal Wetlands
	2107		Bombing Range Ridge
	2108		Caloosahatchee Ecoscape
	2109		Catfish Creek
	2111		Charlotte Harbor Estuary/Flatwoods/Cape Haze
	2112		Corkscrew Regional Ecosystem Watershed (CREW)
	2114		Coupon Bight/Key Deer/Big Pine Key
	2115		Cypress Creek/Trail Ridge
	2172		Cypress Creek/Loxahatchee
	2185		Devils Garden
	2117		East Coast Buffer - Natural Lands
	2118		Estero Bay
	2120		Fakahatchee Strand
	2121		Fisheating Creek
	2122		Florida Keys Ecosystem
	2174		Half Circle L Ranch
	2124		Indian River Lagoon Blueway
	2125		Juno Hills /Dunes
	2176		Jupiter Ridge
	2127		Kissimmee River (Lower Basin)
	2128		Kissimmee River (Upper Basin)
	2126		Kissimmee-St. Johns River Connector
	2129		Lake Wales Ridge Ecosystem
	2132		Loxahatchee Slough
	2134		Miami Dade County Archipelago
	2135		Model Lands Basin

2-A Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
	Project ID	Project Endpoint	Project Name
	2138		North Fork of the St. Lucie River
	2139		North Key Largo Hammocks
	2141		Okaloacoochee Slough
	2142		Okeechobee Battlefield
	2143		Osceola Pine Savannas
	2144		Pal-Mar
	2145		Panther Glades
	2146		Paradise Run
	2147		Parker-Poinciana/Lake Hatchineha Watershed
	2186		Pine Island Slough Ecosystem
	2148		Pineland Site Complex
	2178		Ranch Reserve
	2149		Rookery Bay
	2150		Rotenberger/Holey Land Tract
	2151		Shingle Creek
	2152		Six Mile Cypress
	2154		South Savannas
	2155		Southern Glades - Natural Lands
	2156		Southern Golden Gate Estates (Save Our Everglades) Picayune Strand
	2180		Ten Mile Creek - Natural Lands
	2158		Twelve Mile Slough
	2159		Lake Marion Creek and Reedy Creek Management Area (Formerly called the Upper Lakes Basin Watershed)
	2160		WCAs 2 and 3
STATE COMPLETED PROJECTS			
	2102		Babcock Ranch
	2110		Cayo Costa Island
	2116		Dupuis Reserve
	2123		Frog Pond - Natural Lands
	1305		Kissimmee Prairie Ecosystem
	2130		Lake Walk-In-Water a/k/a Sumica
	2131		Loxahatchee River
	2137		Nicodemus Slough
	2153		South Fork St. Lucie River
	2157		Tibet-Butler Preserve
	2161		Yamato Scrub
FCT, STATE PARKS, & WMAs			
			State Florida Communities Trust Lands
			State Park Lands
			State Wildlife Management Areas
FEDERAL CONSERVATION LANDS			
	2162		A.R.M. Loxahatchee NWR
	2163		Big Cypress National Preserve
	2164		Big Cypress National Preserve Addition
	2165		Biscayne National Park
	2166		Crocodile Lake NWR
	2167		Everglades National Park Expansion
	2169		Florida Panther NWR
	2168		Florida Keys NWR
	2170		Hobe Sound NWR
	2171		J. N. Ding Darling NWR
Objective 2-A.2: Protect 20 percent of the coral reefs by 2010	Project ID	Project Endpoint	Project Name
		TBD	Florida Keys National Marine Sanctuary Zoning Action Plan

2-A Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
	Project ID	Project Endpoint	Project Name
Objective 2-A.3: Improve habitat quality for 2.4 million acres of natural areas in south Florida.	Project ID	Project Endpoint	Project Name
	<i>Note - The April 1999 USACE C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement included an extensive environmental evaluation for the likelihood of CERP in meeting, planning objectives for both spatial extend 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. However, appropriate measures by project are currently being developed through the establishment of interim goals. There are some projects included in this tracking matrix that exemplify how this objective will be achieved and are listed below.</i>		
	2300	2010	C&SF: CERP Strazzulla Wetlands (CERP Project WBS# 39)
	2301	2010	C&SF: CERP Winsberg Farms Wetlands Restoration (CERP Project WBS# 91)
	2302	TBD	C&SF: CERP Lakes Park Restoration (CERP Project WBS# 94)
	2303	2022	C&SF: CERP Restoration of Pineland and Hardwood Hammocks in C-11 Basin (CERP Project WBS # 92)
	2304	TBD	A.R.M. Loxahatchee NWR Prescribed Fire Program
	2306	2009	C&SF CERP Acme Basin B Discharge (CERP Project WBS# 38) (was Project ID #1100)
	2307	2015	C&SF: CERP Picayune Strand Restoration (f/k/a Southern Golden Gate Estates Hydrologic Restoration) (OPE) (CERP Project WBS #30)
	2309	2015	C&SF:CERP Biscayne Bay Coastal Wetlands (FFF) (OPE) (CERP Project WBS #28) (Formerly project ID 1410)
	2310	2011	C&SF: CERP C-111 Spreader Canal (Formerly Project ID 1517)(CERP Project WBS# 29)
	1101	2023	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) (CERP Project WBS# 07)
	1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS# 01)
	1107	2013	C&SF: CERP Site 1 Impoundment and ASR (CERP Projects WBS# 22 and 40)
	1111	TBD	E&SF: Critical Projects - Ten Mile Creek
	1116	2017	C&SF: CERP Broward County Water Preserve Areas Broward County WPA (C-9 Stormwater Treatment Area/Impoundment and Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management) (Formerly Project ID 1501)
	1303	2015	E&SF: Critical Projects : Southern CREW
	1306	2013	Kissimmee River Restoration Project
	1307	2013	Modified Water Deliveries to Everglades National Park
	3902	2016	C&SF: CERP Wastewater Reuse Technology Pilot Project(CERP Project WBS# 37) (Formerly Project ID 3802)

Subgoal 2-B: Control Invasive Exotic Plants and Animals

The MSRP identifies the control of invasive exotic species as 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~~ plants have spread in natural areas to the extent that the native plant and animal communities are being threatened or replaced. The most widespread and serious exotic ~~species~~ plants are detailed in the listed South Florida Environmental Report (SFER) below, along with the extent of their current infestations. This report is developed through a cooperative multi-agency effort including the Task Force’s Noxious Exotic Weed Task Team (NEWTT) and Florida Invasive Animal Task Team (FIATT)

teams. This report includes a comprehensive annually updated compilation and report card for invasive exotic plants and animals in south Florida and is being used by several agencies, organizations, and task teams who develop the SFER with the SFWMD.

Control of invasive non-native species is an important issue for the overall ecological health of south Florida's public conservation lands. The importance of this issue in the Everglades Protection Area (EPA) is demonstrated by the great number of plans, reports, statements, and papers written by numerous committees, state and federal agencies, public and private universities, state and federal task forces, and various other organizations. Most of these documents support an "all-taxa" approach. The consensus of these parties is that control and management of invasive nonindigenous species is a critical component of ecosystem restoration in south Florida. More information is available in the 2008 SFER.

Sixteen different federal and state agencies, numerous local agencies, and two Indian tribes are involved in Everglades restoration and thus in one or more activities related to the management, regulation, control, interdiction, and prevention of invasive exotic species in Florida. Collectively, these agencies have management authority for more than 13.7 million acres (about 21,500 square miles) of Florida's natural lands. Individual agencies have identified 32 of the 66 priority plant species named in NEWTT's 2001 *Weeds Won't Wait* strategy document as particularly serious and specifically targeted for control. Nevertheless, the process of documenting problems associated with exotic animal species in South Florida began only recently.

How This Subgoal Will Be Implemented

Invasive exotic plant management strategies. In 1993 the Florida Legislature charged the DEP with establishing a plan to control invasive exotic plants on public conservation lands (§369.252, *Florida Statutes*). The DEP Bureau of Invasive Plant Management (BIPM) in 1996 developed a comprehensive interagency strategy for elimination or control of the highest priority species and management to control and minimize the spread of other pest plant species.

BIPM has operated its Upland Invasive Exotic Plant Management (Upland Weeds) Program since 1997 as a state-wide strategy to coordinate the efforts of federal, state, and local agencies and nongovernmental organizations in prioritizing needs and developing the methods, research, public education, technology transfer, oversight, and funding needed to conduct an efficient and cost-effective state-wide maintenance control program for the control of upland weeds. From 1997 through 2007, the Uplands Program has spent nearly \$53 million dollars to control approximately 560,000 acres of invasive plants within the South Florida Ecosystem. This effort was assisted by \$23 million in cash and in-kind services from federal, state, and local cooperators.

Planning and Coordination. In addition to providing a comprehensive look at exotic species across taxa, the SFER takes an important step toward coordinating the information generated by the many different agencies involved in the control and management of invasive exotic species and in trying to determine what control and management efforts have been initiated for targeted species. This progress assessment technique (stoplight report card for invasive exotic species – currently the report card only covers plants) has been established along with the development of the SCG's system wide ecological indicators through coordination among the SCG, the NEWTT, and the FIATT of the Task Force. Numerous other agencies and multi-agency groups are involved in the implementation of the management and control of invasive exotic species in south Florida, and in their monitoring and research. Continued collaboration is expected to put in place a coherent and integrated method for evaluating progress on controlling invasive exotic species. It is anticipated that a parallel report card system for exotic animals will be developed within the next two to three years.

The topic of invasive species has been identified as an issue since the beginning of the Everglades restoration initiative. Several organized efforts and mandates have highlighted the problems associated with exotic species in the Everglades region. Control and management of invasive exotic species are in the priorities established by the Task Force in 1993. One of the tasks in the 1993 charter for the former Management Subgroup (December 16, 1993) was to develop a restoration strategy that addressed the spread of invasive exotic plants and animals. USFWS was designated as the lead agency for this strategy and submitted a brief report.

The Working Group's first Annual Report in 1994 addressed all invasive exotic plant and animal species. The overall objectives stated were to (1) halt or reverse the spread of invasive species already widespread in the environment; (2) eradicate invasive species that are still locally contained; (3) prevent the introduction of new invasive species to the South Florida environment; and, (4) educate the public and policy makers about the issues. The 1994 EFA requires the SFWMD to establish a program to monitor invasive species populations and to coordinate with other federal, state, and local governmental agencies to manage exotic pest plants, with an emphasis in the EPA. This work is ongoing through various interagency working groups.

A recently organized group called the Everglades Cooperative Invasive Species Management Area (CISMA) is working to improve coordination, control, and management of invasive species among the key land management agencies through the designation of an Everglades invasive species management area which specifically targets the Everglades Protection Area (EPA) for monitoring, management, and control. The group is modeled after very successful partnerships in western states known as Cooperative Weed Management Areas. Representatives from the NPS, FWS, SFWMD, FWC, FDEP, Florida Department of Transportation, Florida Power & Light, USACE, and the Miccosukee and Seminole Tribes are included in the CISMA.

Reinforcing all efforts is the Task Force's 1996 Scientific Information Needs Report, which contains a region-wide chapter on harmful invasive non-native species. An overall regional objective for restoration is to develop control methods for exotic species at entry, distribution, and landscape levels.

The USFWS Coordination Act Report for the CERP also considers control and management of non-native species as a critical aspect of ecosystem restoration in south Florida. The report discusses the effects of the present canal and levee system and of the preferred alternative of this system on the distribution of exotic animals.

The MSRP identifies non-native animal control as a restoration need for two-thirds of the ecological communities and the individual species covered in the plan. In addition, the South Florida Regional Planning Council's 1991, 1995, and 2004 regional plans for South Florida list the removal of exotic plants and animals and discouragement of introductions as regional policies.

The control and management of invasive exotic species is conducted through these and other efforts of the many individual agencies involved in south Florida restoration. The individual programs funded and supported by the agencies are coordinated through the efforts of the various groups, such as ISWG, FIATT, NEWTT, TAME melaleuca, Biocontrol task team, FWC and NPS/FWS "SWATT" Teams, etc. that focus on various aspects of invasive species control and management among the agencies.

Education. State and federal agencies involved in natural resource protection also have a variety of programs to educate the public and industries. These agencies regularly produce and distribute at outreach events printed media such as weed identification cards and flyers. For instance, the FWC collaborated with other agencies to publish an eight-page insert on invasive species in a 2006 Sunday edition of the Orlando Sentinel. The insert reached approximately 600,000 readers.

Likewise, other state and federal agencies have continually expanded invasive species educational content on their websites and improved cross-agency website linking to further facilitate access to invasive species information. In addition, the agencies represented on the CISMA have agreed to utilize the WEEDAR website for inputting invasive species control data, and the www.ecostems.org website for inputting project level information. Additional information sharing and database sites are being coordinated, linked and interlinked to improve coordination and transfer of information.

Invasive exotic plant management strategies. In 1993 the Florida Legislature charged the DEP with establishing a plan to control invasive exotic plants on public conservation lands (§369.252, Florida Statutes). The DEP Bureau of Invasive Plant Management has developed a comprehensive interagency strategy for elimination or control of the highest priority species and management to control and minimize the spread of other pest plant species.

The Noxious Exotic Weed Task Team (NEWTT) established by the Task Force has completed an assessment and strategy, Weeds Won't Wait, for managing invasive exotic plants and is working with all the agencies to implement the strategy. The following three actions, management plans, maintenance control, and prevention, were identified in Weeds Won't Wait as the highest priorities for ecosystem restoration. Other actions are still being developed and will be incorporated into updates of an implementation plan based on the Weeds Won't Wait strategy.

Management Plans. Comprehensive management plans, when adequately funded and implemented, have provided successful control of invasive exotic plants. These plans offer the advantage of replacing piecemeal efforts to manage exotic plants – typically by controlling them on individual sites or by controlling only one or a few species in broader regions – with coordinated multi-agency programs that integrate invasive plant management activities, organizations, priorities, and resources statewide.

Six-Eight species in Florida (melaleuca, Brazilian pepper, Old World climbing fern, latherleaf, Chinese tallow, hydrilla, water lettuce, and water hyacinth) already have state-wide species-based management plans. More than Another 20 exotic plants need urgent attention, and developing plans for just the top 20 will take several years. Plans must be developed for each species because each has species-specific characteristics (biology, method of reproduction, life form, etc.) that need to be addressed.

The DEP has developed and is implementing the Upland Invasive Exotic Plant Management (Upland Weeds) Program. This is a state-wide strategy to coordinate the efforts of federal, state, and local agencies and nongovernmental organizations in prioritizing needs and developing the methods, research, public education, technology transfer, oversight, and funding needed to conduct an efficient and cost effective state-wide maintenance control program for the control of upland weeds.

Invasive exotic plant Maintenance control. Maintenance control is defined in the Florida Statutes 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 are used in an integrated approach and they include mechanical removal, chemical treatment, and biological controls. The three major aquatic species (hydrilla, water hyacinth, and water lettuce) are currently under a maintenance control program for Florida’s 1.25 million acres of public water bodies. Achieving maintenance control for melaleuca is well underway through

mechanical and chemical treatment. In 1993 the SFWMD estimated more than 252,008 acres of melaleuca within its boundaries (melaleuca also occurs outside the district). Of these total acres 52 percent were public lands and 48 percent were private lands. In 2002 the estimated acreage was 154,423 acres, of which 22 percent were public lands. The decrease of 97,071 acres has been made possible by funding from many agencies, especially the DEP and the SFWMD. As of 2007, there remained 5,000 acres of melaleuca to be treated in Everglades National Park for the entire park to be under maintenance control for this species.

The state is funding research to determine the best approaches for chemical treatment and biological control of Brazilian pepper and Old World climbing fern. ~~Although~~ The Old World climbing fern has only recently been recognized as a-the most serious ecological threat to the South Florida Ecosystem. Between 1998 and 2007 the BIPM Uplands Program expended over \$15 million to control 55,000 infested acres. Both Old World climbing fern and Brazilian pepper are subjects of biological control research, between 1998 and 2004 the state expended over \$6 million to control 32,000 acres of infestations. Plans for other priority species need to be developed and incorporated into the state's multi-agency management framework and invasive exotic plant implementation plan and strategy.

The DEP and the National Park Service (NPS) have jointly implemented Exotic Plant Management Teams for Florida natural areas. An additional team for national wildlife refuges is being planned and funded by the FWS. These teams are trained to identify and remove invasive exotic plants and to help the land-managing agencies bring the species under maintenance control. Some local governments, such as Miami-Dade County, develop management plans and remove exotic vegetation in natural areas within parks and conservation lands. Miami-Dade County develops management plans and removes exotic vegetation in natural areas within parks and conservation lands. Miami-Dade County also has a voluntary program offering owners of environmentally sensitive lands a reduction in taxes in exchange for managing the natural areas to remove invasive exotic vegetation. ~~Miami-Dade County also requires removal of exotic vegetation from all sites as a condition of approval of development and prohibits planting or propagation of invasive species.~~ Additionally, removal of exotics and perpetual maintenance of wetlands and other natural areas is generally achieved or required in mitigation banks and other mitigation lands, such as Hole-in-the-Donut in ENP.

Prevention. ~~The reasons some species become invasive and some ecosystems seem more readily invaded are not well understood. However, if a species becomes widely invasive it is difficult and expensive to manage. Preventing the introduction of invasive species is the only absolute means to control them, but absolute prohibitions and exclusions are impractical. An early warning program for potentially invasive species, a risk assessment for evaluating possible invasiveness prior to introduction, methods for early detection of incipient populations of new species, predictive tools to assist in determining where plants may invade, and the ability to eradicate incipient populations are needed. The Federal Interagency Committee for the Management of Noxious Exotic Weeds is planning a national early warning information system for invasive exotic plants.~~

Biological control of invasive exotic plants. Plants are often prevented from becoming serious weeds in their native range by a complex assortment of insects and other herbivorous organisms. When a plant is brought into the United States, the associated pests are thoroughly screened by government regulations on plant pest importation. Favorable growing conditions and the absence of these associated pest species have allowed some plants to become serious weeds outside their native range. "Classical" biological control seeks to locate such insects and import host-specific species to attack and control the plant in regions where it has become a weed. The classical approach has a proven safety record (none of the approximately 300 insect species imported specifically for this purpose have ever become pests themselves) and has been effective in controlling almost 50 species of weeds.

In Florida, classical biological control of invasive nonnative plants in nonagricultural areas has historically focused on aquatic weeds. The first such biocontrol agent introduced was the alligatorweed flea beetle (*Agasicles hygrophila*) in 1964 for control of alligatorweed (*Alternanthera philoxeroides*). In 2002, the USACE authorized the Melaleuca Eradication and Other Exotic Plants project that provides additional support for the propagation and distribution of new biological control organisms that have been approved for release. Current biological control research is focused on hydrilla, water hyacinth, melaleuca, Brazilian pepper, and Old World climbing fern. Two biological controls for melaleuca have been released. The first Old World climbing fern insect (a moth) was released in 2005, and a second insect has been approved for release. The first Brazilian pepper insect and additional melaleuca-damaging insects may be approved for release in Florida soon. Overseas surveys and host-specificity screening for additional agents are ongoing.

Controlling invasive exotic animals. The effort to address the issue of exotic animals in the Everglades is not as advanced as that of invasive plants. As a result, the Working Group asked FIATT to develop a strategy and build a priority list. While it is relatively easy to determine the extent to which exotic plants invade natural areas, the impact of exotic animals on native communities and on those species with which they compete directly is often less obvious (SFER 2008). Several existing reports have highlighted this difficulty.

One example invasive exotic animal species and its detrimental effect on the South Florida Ecosystem is the Gambian pouch rats (*Cricetomys gambianus*). Native to Africa, Gambian pouch rats were bred in captivity on Grassy Key. It is believed eight rats escaped between 1999 and 2002 and established a reproducing population. Gambian rats weigh an average of 3 pounds and measure 20–35 inches from head to tail, which is much larger than native species, including the Key Largo wood rat, cotton rat, and silver rice rat. Its large size makes this species popular in the exotic pet trade, although the U.S. Food and Drug Administration has banned their transport and sale because they are a carrier of monkey pox. Scientists are concerned this species is poised to move from Grassy Key onto adjacent keys, and then to Florida's mainland. Eradication efforts through bait stations and trapping have begun.

Monitoring. Monitoring programs are important in establishing the extent of a problematic species and can offer valuable spatial information for ecological studies and control purposes and benchmarks once operational control programs begin. Similarly, long-term, repeatable monitoring is key to answering questions related to the impacts of invasive species over time. The general occurrences of most invasive exotic plants in south Florida are fairly well understood, although detailed information on distributions and expansion rates are lacking. Agency-sponsored programs are in place that track the regional distribution of certain target exotic plant species, yet spatial data for most other invasive taxa in natural areas is lacking or not readily accessible. The FWC maintains a county-level database for reptiles, amphibians, birds, and terrestrial mammals (www.myfwc.com/critters/exotics/exotics.asp). FWC biologists compiled these data from both published and unpublished sources. The U.S. Geological Survey (USGS) maintains an extensive database for exotic aquatic species by watershed.

The SFWMD conducts surveys of the EPA biannually as required by the EFA, but has expanded the scope of the survey in recent years to include the entire District (2005) and the entire range of several key species (2006).

Prevention. The reasons some species become invasive and some ecosystems seem more readily invaded are not well understood. However, if a species becomes widely invasive it is difficult and expensive to manage. Preventing the introduction of invasive species is the only absolute means to control them, but absolute prohibitions and exclusions are impractical. An early warning program for potentially invasive species, a risk assessment for evaluating possible invasiveness prior to introduction, methods for early detection of incipient populations of new species, predictive tools to assist in determining where plants

may invade, and the ability to eradicate incipient populations are needed. The Federal Interagency Committee for the Management of Noxious Exotic Weeds is planning a national early-warning information system for invasive exotic plants.

Long-Term Operations and Maintenance Needs

Weed management is like any other long-term program in that sufficient funds must be available on a continuous basis to achieve and then sustain maintenance control. If resources necessary to support management drop below the maintenance level requirement, the species will expand and reinvade to pre-control levels, and the program must start from zero again. The only exception is when adequate maintenance control is being achieved exclusively through biological control organisms and even in those instances, minimal monitoring is needed to ensure that the biocontrol organisms are continuing to work. Discontinuing funding once maintenance control has been achieved is a problem that has continually plagued invasive species management programs nationally.

Factors Affecting Achievement of this Subgoal

~~Management complexity. The control programs for water hyacinth, water lettuce, and hydrilla have been successful because good management plans were developed for each species that included prioritizing sites for control, assessing the extent of infestations, directing essential research to understand the biology of the species, and specifying proven control techniques. The plans have multi-agency coordination and adequate funding.~~

To ensure success in bringing ~~other~~ high priority plants and animal species under ~~maintenance~~ control, agencies will need to build upon the foundation of coordination and cooperation that has been established as part of their collective planning and control efforts to date. Collective efforts sufficient to manage invasive species throughout Florida will require formal agreements supporting the multi-agency approach and the formal designation of a lead agency to direct cooperative planning, project integration, and integrated budgets and resource requests. The development of the CISMA is directed at formalizing an agreement(s) among the many agencies working on invasive species within the EPA boundary. ~~Identifiable elements from~~ The strategies outlined in Weeds Won't Wait and other plans (e.g. ISWG) developed by the DEP and the Task Force NEWTF need to be integrated to expand policy setting, planning, prioritization, funding, and management to the ecosystem level.

Interface with infested landscapes. Continuing degradation of the natural environment may enhance the spread or rate of spread of exotic species. Adjacent landowners will impact the success of controlling exotics if these lands remain infested or if the landowners are not interested in land acquisition.

Importation of new exotics. The unregulated importation of new plant and animal species continues to increase the potential for infestations of exotic plantsspecies.

Risk Assessment. There is an important need to be able to determine which species, both plant and animal, have the highest probability of become invasive in south Florida. There are a number of "risk assessments" that have been done that can serve to assist in determining "invasiveness" including species that are already naturalized but not yet invasive, and species that may be either poised to arrive in the near future or are new arrivals. Such a risk assessment tool will enable managers and scientists to prioritize species for monitoring and control.

Specific, Measurable Objectives for Achieving this Subgoal

Three objectives for achieving this subgoal have been adopted by the Task Force:

- ~~Coordinate the development of management plans for the top 20 south Florida invasive exotic plant species by 2011~~
- Achieve maintenance control of Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern on south Florida’s public conservation lands by 2020
- ~~Complete an invasive exotic plant species prevention, early detection, and eradication plan by 2007~~
- Release 2 biological control insects per year for the control of invasive exotic plants
- Achieve eradication of Gambian pouch rat by 2012

The key projects ~~that are currently funded and being implemented~~ needed ~~needed~~ toward helping to achieve these objectives and the schedule for their implementation are shown in Strategic Plan Table 6.

Strategic Plan Table 6 – Subgoal 2-B: Control Invasive Exotic Plants and Animals

2-B Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
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	Project ID	Project Endpoint	Project Name
	2501	2009	Monitoring the Effects of Repeated Aerial Herbicide Application on Lygodium microphyllum and Native Vegetation.
	2502	TBD	Invasive exotic plants control in terrestrial and aquatic natural systems
	2503	TBD	Invasive Species Research and Information Exchange
	2504	TBD	Develop and implement a FWS Florida Invasive Species Strike Team
	2505	2026	C&SF: CERP- Melaleuca Eradication and other Exotic Plants(Formerly Project ID 2602) (CERP Project WBS# 95)
	2506	TBD	Everglades National Park Exotic Control Program (Formerly Project ID 2604)
	2507	TBD	Hole-in-the-Donut (Formerly Project ID 2606)
	2508	TBD	Aquatic and Upland Invasive Plant Management
Objective 2-B.2: Release 2 biological control insects per year for the control of invasive exotic plants	Project ID	Project Endpoint	Project Name
	2601	TBD	Casuarina Biological Control Agents
	2602	TBD	Melaleuca Biological Control Agents
	2603	TBD	Lygodium Biological Control Agents
Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2012	2700		Eradication of Gambian Pouch Rat
	Completed Projects		
	2603	2004	Estero Bay Aquatic Preserve and Buffer Reserve Enhancement and Exotic Removal Project
	2701	2004	Melaleuca Quarantine Facility

Goal 3: Foster Compatibility of the Built and Natural Systems

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 and the subsequent need for [developable land and related infrastructure and](#) public services ~~have~~ [has](#) resulted in adverse impacts on natural ecological systems. These impacts include loss of marine, wetland, and upland habitat, severe drawdown of freshwater resources, intrusion of saltwater into freshwater aquifers, loss of open space, and degradation of water quality. The rapid rate and volume of growth and the accompanying sprawl development patterns have reduced the spatial extent and vitality of the natural system. Its declining health has become more apparent as symptoms of stress have developed in the South Florida Ecosystem. ~~The~~ [This](#) imbalance, [further complicated by hurricanes and drought](#), has caused state, local, regional, and national decision-makers and citizens to focus on addressing the unintended consequences of growth.

A consensus-building exercise in 1999 with broad public input identified a list of statements that Task Force participants used as a foundation to develop the Task Force *Strategy*. Based on that consensus, the compatibility of the built and natural systems will be achieved when the following conditions are met: The people of south Florida understand the connections between a healthy environment and a healthy community. Development patterns – development, redevelopment, and infrastructure – are complementary to ecosystem restoration and compatible with a restored natural system. Development practices support conservation of significant and special natural areas and reduce habitat fragmentation. Flood-protection level of service and water resources are maintained at existing levels, or augmented where appropriate. The quality of life of people in south Florida is enhanced through the ability to reside in areas with fishable, drinkable, and swimmable water and clean air. Parks, open space, recreation lands, blueways, greenways, and roadways are compatible with and complementary to getting the water right and enhancing and preserving the natural system. Land, water, wastewater, and transportation planning are coordinated and supportive of ecosystem restoration. Agriculture is an environmentally and economically sound component of the landscape, consistent with ecosystem restoration. In agricultural and urban areas, stormwater and wastewater are reclaimed when possible. The ecosystem is not damaged by improper disposal of wastes.

The same issues that are critical to the natural system – getting the water right and restoring, preserving, and protecting diverse habitats and species – are equally critical to maintaining a high quality of life for south Florida’s residents. Like the future of south Florida’s natural systems, the future of its human communities is dependent on getting the water right. The appropriate quantity, quality, timing, and distribution of water is essential to meeting the future water supply needs generated by projected population growth and by continuing economic productivity, most notably in tourism and agriculture (the two largest sectors of the economy). The overriding issue is not who gets the water, the natural system or the built system, but how to fulfill all water needs by ensuring that what is built can be adequately supported within the parameters of a healthy natural system. Failure to achieve this compatibility would likely be detrimental for both future residents and the environment. Recognizing this relationship, the State of Florida’s guiding [water resources](#) statute, Chapter 373.016, in the Declaration of Policy, promotes the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems.

Similarly, ~~in order~~ 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 will require development patterns, policies, and practices that serve both built and natural systems. [Chapter 163, Part II, F.S., the Local Government Comprehensive Planning and Land Development Act, further recognizes this relationship.](#) Urban, suburban, and rural development utilizes lands that would otherwise be available, [whether through protection, conservation, or acquisition](#), to support natural system functioning. To the extent that development patterns in these areas are sensitive to the critical needs of both community residents and the natural system, south Florida's communities can be a sustainable part of a healthy ecosystem.

~~Providing the~~ [land](#) ~~for~~ 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.

Providing sufficient water resources, using and managing land, and maintaining and improving flood protection – all in a manner compatible with restoration of the South Florida Ecosystem – are important subgoals for fostering compatibility of the built and natural systems. Land use planning, flood control, environmental regulation, and similar activities needed to accomplish these subgoals are primarily the responsibility of the tribal, state, regional, and local governments in Florida. These government agencies must function within the authorities and appropriations for programs and activities established by the Florida Legislature and the local elected governing bodies. Constitutionally protected private property rights and the freedom of movement of the American people are also factors that affect ~~the~~ growth and development patterns in [a given state and in localities](#) Florida.

The Task Force members recognize that these factors affect implementation of the restoration *Strategy* and achievement of the strategic goals. Efforts to achieve goal three must incorporate a process to address concerns of environmental justice and economic equity. The unique cultural and ethnic diversity of south Florida's population, with its strong representation of peoples from all over the world, will require significant efforts on behalf of the restoration partners to ensure that projects are implemented in ways that do not result in disproportionate impacts on any communities. Additional targeted efforts will be required to provide opportunities for socially and economically disadvantaged individuals and small businesses to participate in the implementation of restoration programs and projects. The Task Force and Working Group see this guiding principle as critical to long-term success.

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

How This Subgoal Will Be Implemented

Compatible land use policies and practices. State, regional, and local agencies are using a variety of planning tools to foster increased compatibility of the built and natural systems. Over the past several decades Florida has enacted several pieces of legislation regarding comprehensive planning and growth management, including the Local Government Comprehensive Planning and Land Development Regulation Act ([Chapter 163, Part II, F.S.](#)), which provide an integrated framework of planning at the state, regional, and local levels. ~~Nevertheless~~ ~~However~~, growth continues to stress both public infrastructure and the natural environment, ~~and while well intended, improvements to the Act are needed.~~

~~The Governor's Growth Management Study Commission has reported that although the processes established by the existing growth management laws were well intended, improvements to the process should still be made.~~

Recognizing the critical importance of water to both the built and natural systems, in 2002 the Florida Legislature passed a law ~~in 2002~~ that addresses growth management and alternative water supply. The law requires that the comprehensive land use plans of counties and cities be coordinated with the ~~completed~~ regional water supply plans of the state's five water management districts to ensure the availability of adequate water supplies. Therefore, the SFWMD was required to evaluate whether adequate water supplies existed to meet the needs of its region. Where water supply was not adequate, the SFWMD prepared regional water supply plans, identifying how water supply needs can be met for the next 20 years. The local governments that fall within the area of a regional water supply plan are required to ensure that adequate water supplies will be available to meet future demand by developing 10-year water supply facilities work plans. These work plans must include alternative water supplies, water reuse and conservation programs, and must be incorporated into the local government's comprehensive plans. Many of the region's local governments subject to this law are late in adopting their 10-year water supply facilities work plans. The Florida Department of Community Affairs (DCA) in conjunction with the SFWMD has launched an initiative to identify the delinquent local governments and provide them with support and assistance in complying with this law.

~~An initiative by the Florida Department of Community Affairs (DCA) involves the review and analysis of existing and future land use designations adjacent to lands identified for acquisition for ecosystem restoration and associated buffers. DCA anticipates working with local governments as they develop the criteria for this review process.~~

In addition, the DCA is undertaking a land use compatibility analysis for selected restoration projects. This involves a review and analysis of existing and future land use designations, including related densities and intensities, adjacent to and surrounding selected ecosystem restoration project footprints. The analysis will also address how current and potential future land uses impact, are compatible with, and/or further restoration efforts.

Chapter 163, Part II, F.S., does not specifically address Everglades protection or restoration. While attempts to amend Florida Statutes in this regard during the 2008 Legislative Session did not succeed ~~may or may not succeed~~, the DCA is taking the initiative to identify within the boundaries of the SFWMD, the number of local governments that adopted into their local government comprehensive plans, goals, objectives, and policies to protect the Everglades and further South Florida Ecosystem restoration. It is the DCA's intent, with the assistance of the SFWMD, to encourage these local governments to address South Florida Ecosystem restoration through the comprehensive planning process as well as through any community or regional visioning initiatives.

Redevelopment of brownfields. Federal (USEPA), state, regional, and local programs are contributing to the cleanup and redevelopment of contaminated and abandoned or underused sites in urban and rural areas of south Florida through the Brownfields Redevelopment Program. Actual or perceived environmental contamination in urban infill sites—along with the risks and costs associated with cleanup—is a significant barrier to redevelopment. This is an important component of Goal 3. Productive reuse of urban land helps prevent the premature development of farmland, open space and natural areas, which furthers in restoration efforts.

The Eastward Ho! Brownfields Partnership, which includes Miami-Dade, Broward, and Palm Beach Counties, is a good example of how local, regional, state, and federal agencies are working with private nonprofit and community organizations to facilitate the redevelopment of brownfields. The partnership received a National Brownfields Showcase Community designation from the USEPA in 1998. The USEPA also has granted \$2.2 million to capitalize a brownfields cleanup revolving loan fund, which is being used to assist in the cleanup and reuse of brownfields in southeast Florida.

Since 1998, this Brownfields Partnership has been able to leverage approximately \$75 million dollars in federal, state, local and private funding for brownfields cleanup and redevelopment activities. The redevelopment activities have created and/or retained approximately 2,000 jobs and 600 low-to-moderate income housing units.

The Brownfields Partnership has also been active in the Florida Brownfields Program, administered and implemented by the DEP. The DEP has delegated the administration and implementation of the Florida Brownfields Program in their respective jurisdictions to Miami-Dade and Broward Counties. This streamlines the review and implementation of assessment and cleanup activities. Miami-Dade and Broward Counties are the only counties in the state of Florida to receive this delegation.

Protection of land for parks, open space, and a wide range of compatible recreational uses. People's enjoyment of nature is arguably the strongest impetus for the broad public support of ecosystem restoration. Many of the cultural traditions of the residents of south Florida have been shaped by people's access to expansive wetland, upland, and marine habitats harboring abundant populations of fish, birds, and other wildlife, and to exceptionally beautiful landscapes where they could lose themselves for days or a few moments. As citizens and their governments work to restore and protect the unique South Florida Ecosystem, they must not lose sight of the importance of public access to natural areas. At the same time the public must respect the sensitivities of the natural system and ensure that their activities do not unduly stress the wildlife and the landscapes that are such an important part of their heritage.

The Task Force members are working to protect opportunities for a wide range of compatible outdoor recreational activities for all residents of south Florida and their visitors. The acquisition of rural and urban park, recreation, and other open space lands, and efforts to link these natural areas through a system of greenways, blueways, and trails, are essential to the implementation of Goal 3 specifically addressed in this section of the Task Force Strategy. So are the efforts to help ensure that agricultural lands, which provide valuable open space and wildlife habitat, remain undeveloped. Other efforts include the improvement of recreational areas with appropriate facilities (including boat ramps, off road vehicles/airboat ramps, hiking trails, and horse trails) and the management of canals to enhance fishery habitat. The work to improve the health and productivity of habitats, addressed directly by goal two and indirectly by goal one, is expected to restore a sustainable natural system that south Floridians may continue to enjoy for generations to come. Local, state, and federal efforts to ensure a variety of opportunities for people's access to this natural system are a critically important complement to this work.

Park, recreation, and other open space lands. Park, recreation, and other open space lands protect natural systems and/or serve as buffers between natural and built environments. They often improve water quality and help attenuate flood waters after significant storm events. Public access to these areas fosters an appreciation for the natural system. When residents of urban areas have access to natural areas and a variety of resource-based recreational opportunities, it increases the potential that they will appreciate the importance of protecting a healthy natural system.

For instance, DCA's ~~The~~ Florida Communities Trust program provides grants to local governments to help implement the natural resource, conservation, coastal, and recreation elements of their statutorily mandated Local Government Comprehensive Plans. These grant funds are primarily used for the acquisition of community-based parks, open space and greenways that further outdoor recreation and natural resource protection needs ~~green and open space and park and recreation lands at the local level.~~ In addition, many localities use grant funds appropriated by the Florida Legislature to acquire and develop land for public outdoor ~~local park and~~ recreation areas under the Florida Department of Environmental Protection's (DEP)'s Florida Recreational Development and Assistance Program.

~~Linked open space and buffers.~~ Greenways, blueways, and trails multiply the benefits of open spaces and natural systems by linking those spaces together, and they enrich the quality of life of community residents and visitors by facilitating access to the state's natural and cultural heritage sites and by enhancing people's sense of place. In some cases, the greenway system also offers opportunities to improve the water quality of stormwater runoff by providing natural areas that help filter or uptake contaminants and diminish silt.

~~The DEP's Office of The Florida~~ Greenways and Trails ~~System is~~ working to establish a state-wide ~~initiative to create a~~ system of greenways and trails connecting communities and conservation areas. When completed, the system will connect one end of the state to the other, from Key West to Pensacola. One goal of the program is to work with land managers to add an additional 10 percent per year to the total lands designated. The criteria for a designated land or waterway are that it must (1) protect and/or enhance natural, recreational, cultural, or historic resources and (2) either provide linear open space or a hub or site, or promote connectivity between or among conservation lands, communities, parks, other recreational facilities, cultural sites, or historic sites. The designation program encourages voluntary partnerships in conservation, development, and management of greenways and trails, provides recognition for individual components of the system and the partners involved, and raises public awareness of the conservation and recreation benefits of greenways and trails.

Protecting and preserving sustainable agriculture. Agriculture is Florida's second leading industry, producing according to the Florida Agricultural Statisticsal Directory Highlights 20076, Florida's agricultural industry has an overall total economic impact of \$18 87.6 97.8 billion in economic value each year. A large portion of agricultural land can be viewed as open space that benefits the natural system through buffering, augmentation of natural habitats, water storage and filtration, and aquifer recharge. It is of great concern that Florida is losing its farms and ranches because of declining profitability, land valuation, import/export, trade issues, immigration laws and urban sprawl. State-wide almost 150,000 acres of productive agricultural lands are converted to other land uses each year. In the past some agricultural practices have impaired the functioning of natural systems, sometimes with adverse effects on native plants and animals, and sometimes to the detriment of the ability of the land to sustain agricultural uses over the long term. Several regulatory and voluntary programs are underway in the South Florida Ecosystem and other areas in Florida to enhance environmental quality and the natural resource base upon which the agricultural economy depends.

The Everglades Best Management Practices Program, required by the 1994 Everglades Forever Act, specifically addresses the EAA and the C-139 Basin. The program goal of achieving a 25 percent reduction in the phosphorus load from the EAA has been met for each water year since the first full year of implementing BMPs (water years 1996 – 2003). EAA farmers have implemented a variety of practices to reduce the levels of phosphorus coming from their farms, including efficient fertilizer application, control of erosion and sediment loss, and effective stormwater management. Similar BMPs are implemented in the C-139 Basin, which is located adjacent to the EAA. The goal in this basin is to maintain phosphorus loads at or below historic levels.

The federal Farm Bill of 2002 provides several voluntary conservation programs through the USDA to assist landowners in protecting and preserving their natural resources. The USDA provides incentive payments and cost-sharing to restore, enhance, and protect degraded wetlands on agricultural lands, including the purchase of easements through the Wetland Reserve Program. The Farm and Ranch Land Protection Program (FRPP) helps farmers and ranchers keep their land in agriculture through the purchase of conservation easements in partnership with local and state governments and nonprofit entities. The Environmental Quality Incentive Program promotes agricultural production and environmental quality as compatible goals. Financial and technical assistance is provided to landowners to implement BMPs to improve water quality or enhance natural resource values. The Wildlife Habitat

Incentives Program encourages the creation of high-quality wildlife habitats that support wildlife populations important to the ecosystem. Financial assistance is provided to develop upland, wetland, riparian, and aquatic habitats on private lands. The Grassland Reserve Program helps landowners and operators restore and protect grassland, including rangeland and pastureland, while maintaining the areas as grazing lands. Implementation of these programs will contribute significantly to the strategic goals for South Florida Ecosystem restoration.

Strategies for implementing the 2001 Rural and Family Lands Protection Act. The conversion of rural lands to higher density and more intense uses is having a profound effect on Florida's ability to maintain a balance between population growth and the natural resources necessary to support that growth. The development of previously isolated rural landscapes is fragmenting and degrading the quality and character of Florida's natural and agricultural lands. The prevailing development patterns threaten the state's ability to meet the needs of its citizens through adequate delivery of services and the maintenance of an agricultural economy. Additionally, these growth patterns interrupt the natural hydrological and biological functions that support not only sustainable agriculture and healthy ecosystems, but also the quality of life enjoyed by south Floridians.

The Florida Legislature recognized the importance of maintaining a healthy agriculture industry when it passed the Rural and Family Lands Protection Act of 2001. This act authorizes the responsible agencies to develop strategies to protect rural, agricultural, and timber lands. Implementation strategies and appropriations for this effort are currently being developed, and appropriations continue to be sought for the program.

One such strategy is to secure conservation easements or protection agreements to compensate property owners for restrictions on the future use of their land. One of the biggest challenges in administering these programs is identifying economic resources to fund the program each year in a growing state struggling with many fiscal challenges. Recognizing these challenges in Florida and elsewhere, the NRCS FRPP provides matching funds to state, tribal, and local governments and nongovernmental organizations with existing farm and ranch land protection programs to purchase conservation easements that help keep land in agriculture.

Concerned with the rapid rate at which agricultural lands are being converted into an urban environment in south Florida, federal and state agriculture agencies are implementing a number of incentive programs to decrease that rate. An effort is underway to assess how much land is in productive agriculture and what kind of development pressure it is under. The DEP, DACS, and the University of Florida Institute of Food and Agricultural Sciences have been working together to implement incentive programs and to collect comprehensive data that will support efforts to retain viable and sustainable agriculture as part of the South Florida Ecosystem.

Redevelopment of brownfields. Federal (USEPA), state, regional, and local programs are contributing to the cleanup and redevelopment of contaminated and abandoned or underused sites in urban and rural areas of south Florida. Actual or perceived environmental contamination in urban infill sites—along with the risks and costs associated with cleanup—is a significant barrier to redevelopment. The remediation of this problem is contributing to the revitalization of south Florida's historic developed areas. This revitalization is expected to lessen development pressure and urban sprawl in areas needed in order to restore the South Florida Ecosystem and to ensure future regional water supplies.

The Eastward Ho! Brownfields Partnership, which includes Miami Dade, Broward, and Palm Beach Counties, is a good example of how local, regional, state, and federal agencies are working with private nonprofit and community organizations to facilitate the redevelopment of brownfields. The partnership received a National Brownfields Showcase Community designation from the USEPA in 1998.

~~The USEPA also has granted \$2 million to capitalize a brownfields cleanup revolving loan fund, which is being used to assist in the cleanup and reuse of brownfields in southeast Florida.~~

~~The Partnership has also been active in the Florida Brownfields Program, administered and implemented by the DEP. The DEP has delegated the administration and implementation of the Florida Brownfields Program in their respective jurisdictions to Miami Dade and Broward Counties. This streamlines the review and implementation of assessment and cleanup activities. Miami Dade and Broward Counties are the only counties in the state of Florida to receive this delegation.~~

Community Understanding of Restoration Projects. The USACE and the SFWMD coordinated an intensive public involvement process during the development of CERP, which culminated in more than 1,500 people attending 12 public meetings in the fall of 1998. The agencies remain committed to involving the public in all aspects of CERP implementation. Their *Public Outreach Program Management Plan*, completed in 2001, defines the general scope, schedules, costs, products, and funding requirements necessary for the first five years of outreach activities.

The major elements of the outreach plan are summarized below:

- General public awareness: Information about the CERP will be provided to the general population through media stories, participation by CERP outreach staff at community events, and distribution of informative print, electronic, and other materials.
- Minority community outreach: Special efforts will be made to inform and involve African-American, Haitian, and Hispanic residents of south Florida about [the](#) CERP – groups that historically have been underrepresented in environmental programs.
- Environmental education: Appreciation of the Everglades and other natural resources by the youth of today is extremely important because they will benefit from, and perhaps even participate in, [the](#) CERP and other related restoration efforts as adults. Curricula and teachers' guides will be developed and distributed in K-12 schools throughout the 16-county south Florida region, often in partnership with the Newspapers in Education program.
- Small business outreach: Many CERP components will be handled by the private sector through contracts. Outreach activities will seek to empower and enable south Florida's small businesses to do business with the USACE and its partners. Staff will proactively engage and assist small businesses through business forums, workshops, and training sessions, development of web sites, distribution of printed materials, and other means.
- Project-level involvement: ~~Hundreds of public meetings, public~~ [Public](#) workshops, and public meetings ~~have already been held to~~ [will](#) involve local residents in the development of CERP projects. ~~These have been widely publicized, planned in locations convenient to the public, and often featured an open house for staff to meet with residents.~~ This form of [one-on-one project specific](#) communication is essential to the success of [the](#) CERP.

The Working Group also participates in a public-private partnership between the Task Force and the Museum of Discovery and Science. The success of this collaborative effort will result in environmental education programs, enhanced outdoor exhibitry, and an informative kiosk about the South Florida Ecosystem restoration effort, which will provide information to the half million people who visit the museum annually.

Factors Affecting Achievement of this Subgoal

Unanticipated growth. [The Kissimmee Watershed is the largest and relatively least developed area that influences Lake Okeechobee and its discharges. However, in the Upper Kissimmee Basin alone, there are 32 Developments of Regional Impact \(DRI\) at some point in the approval process, not including](#)

developments that fall below the DRI threshold. Furthermore, urban and suburban development is now expanding onto agricultural lands in the heart of the Kissimmee Chain of Lakes Watershed. Growth patterns in that area are expected to double by the year 2025 and new transportation corridor proposals in the Upper Kissimmee Basin have the potential to make the area more favorable for future development.

~~Accelerated growth in south Florida, growth is exceeding state and local government predictions. over predicted levels will significantly increase the loss of open space to other land uses, particularly development. Government agencies are preparing long-term plans and setting priorities based on assumptions about levels of growth and demand for services, If the assumed rate of growth is exceeded, the ability of local governments and state agencies to protect the natural system may be reduced and South Florida Ecosystem Restoration initiatives may be compromised. which if eclipsed will seriously challenge the ability of local governments and agencies to respond in ways that adequately protect the natural system.~~

Management complexity. Fostering development patterns that are compatible with natural systems requires close coordination of multiple jurisdictions with authority over the built environment. Without such coordination, gains in compatibility on lands within one jurisdiction (in habitat connectivity, for example) might be negated by incompatible development in a neighboring jurisdiction. Because many development issues involve corridors such as roads, transit routes, or greenways that cross multiple jurisdictions, unilateral actions by individual communities are often impossible.

Coordination is also required between jurisdictions with authority over the built environment and jurisdictions with authority over natural systems. The strategic goal is compatibility, and any efforts that undermine the sustainability of either the built or the natural system could further harm the ecosystem, as described above in the Upper Kissimmee Basin discussion. Potential regulations on agriculture also pose a good example. On the one hand, any federal, state, or local agricultural policy intended to protect natural systems but that does not sufficiently provide for economic stability of the industry may result in such unintended consequences as a long-term reduction in open space and wildlife habitat as agricultural land is converted to other land uses. On the other hand, agricultural practices that degrade the natural environment may also ultimately prove catastrophic to agriculture. If awareness of and respect for these interrelationships lags behind other considerations, the success of ecosystem restoration may be delayed.

Funding. Local and regional jurisdictions will need adequate revenues and possibly supplemental funding to develop plans for a better pattern of protection by acquiring land, or less-than-fee interests in land, to link park, recreation, open space, and other significant land and water areas, and to enforce environmental regulations for the protection of those areas. Florida's current economic climate, including state budget shortfalls, reduced Legislative funding for "Everglades restoration" and the passage of a 2008 property tax amendment to the Florida Constitution, further amplify the need for partnerships, efficiencies, and coordination among multiple jurisdictions. ~~Changes in local, state, or federal economic conditions may change the priorities of projects needed to implement this subgoal.~~

Environmental Justice. Early and sustained participation in ~~community~~ the affairs of a community by all segments of its population ~~the community~~ is critical to the implementation of this subgoal. This may not occur unless policies and activities designed to involve all segments of the community are institutionalized so that they may continue beyond the timeline of the Task Force Working Group. Environmental ombudsmen located in restoration partner agencies would aid in getting community issues to the appropriate person and responsible agency. In addition, trained volunteers who continually

improve the knowledge base of restoration in the community will be important: [coupled with on-going educational programs.](#)

Specific, Measurable Objectives for Achieving this Subgoal

Five objectives for achieving this subgoal have been adopted by the Task Force:

- ~~• Prepare a land use analysis for selected restoration projects. Designate or acquire an additional 480,000 acres as part of the Florida Greenways and Trails System by 2009~~
- 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
- ~~• Increase participation in the voluntary Farm Bill conservation programs by 230,000 acres by 2014~~
- 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. Acquire an additional 2,500 acres of park, recreation, and open space lands by 2007
- Increase the number of local governments that adopt into their comprehensive plans (goals, objectives, policies, and related strategies) - concepts compatible with South Florida Ecosystem restoration
- ~~• Complete five brownfield rehabilitation and redevelopment projects by 2010. Increase community understanding of ecosystem restoration~~
- Increase the use of educational programs and initiatives to further the publics’ and local governments’ understanding of the benefits of South Florida Ecosystem restoration

The key projects needed to achieve these objectives and the schedule for their implementation are shown in Strategic Plan Table 7.

Strategic Plan Table 7 – Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration

3-A Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
Objective 3-A.1: Prepare a land use analysis for selected restoration projects	Project ID	Project Endpoint	Project Name
	3100	2010	Analysis of Land Use Patterns Surrounding CERP Projects
Objective 3-A.2: 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	Project ID	Project Endpoint	Project Name
	3200	Ongoing	Florida Keys Overseas Heritage Trail (Formerly Project ID 3301)
	3201	Ongoing	Lake Okeechobee Scenic Trail (Formerly Project ID 3102)
	3202	2009	Florida Greenways and Trails Program (Formerly Project ID 3100)
Objective 3-A.3: Increase participation by 350,000 acres in the Grassland Reserve Program, Wetland Reserve	Project ID	Project Endpoint	Project Name
	3300	2007	2002 Farm Bill (Formerly Project ID 3202)

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	3301	2011	Technical Assistance to Seminole and Miccosukee Indian Reservations (Formerly Project ID 3201)
Objective 3-A.4: Increase the number of local governments that adopt into their comprehensive plans (goals, objectives, policies, and related strategies) - concepts compatible with South Florida Ecosystem restoration	Project ID	Project Endpoint	Project Name
	3400	2010	Consideration of Land Use Policies and Planning by Local Governments with the CERP
Objective 3-A.5: Increase the use of educational programs and initiatives to further the publics' and local governments' understanding of the benefits of South Florida Ecosystem restoration	Project ID	Project Endpoint	Project Name
	3502	Ongoing	USACE Outreach Program
	3503	Ongoing	SFWMD Outreach Program

Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem 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 environmental protection projects, including increased canal and groundwater levels, need to be accomplished in a way that does not harm flood protection.

The SFWMD operates and maintains the primary flood control and water supply system within its 16-county jurisdiction. The major portion of that system is comprised of the federally designed and constructed C&SF Project. The SFWMD operates and maintains the multi-purpose C&SF Project and projects within the Big Cypress Basin pursuant to regulation schedules and operational guidelines established by the USACE.

The C&SF Project, which was first authorized by Congress with the Flood Control Act of 1948, is multi-purposed; providing flood control, water supply for municipal, industrial, and agricultural uses, prevention of saltwater intrusion, water supply for ENP, and protection of fish and wildlife resources. Most of the originally authorized project facilities were constructed during the period from 1950 to 1972. Some modifications to the primary system have occurred since the original authorization. The primary system includes 1,969 miles of canals and levees, 160 major drainage basins, 501 major structures and 50 pump stations.

This primary regional system is complemented by secondary and tertiary systems that are operated and managed by local governments, drainage districts established by Chapter 298 of the Florida Statutes, and private interests to ensure that the drainage and surface waters are routed to the primary drainage system.

~~The C&SF Project was originally authorized by the Flood Control Act of 1948, and most of the originally authorized project facilities were constructed during the period from 1950 to 1972. Some modifications to the primary system have occurred since the original authorization.~~ Larger than predicted population growth and different development patterns from those projected in 1948 have, over time, challenged the

ability of the primary, secondary, and tertiary drainage systems to meet the original goals of maintaining flood protection for urban and agricultural lands.

Maintaining efficiencies in a combination of primary and secondary drainage systems is needed to achieve and maintain original design flood protection planning goals for south Florida. Further modifications, updates, and upgrades are needed in many of the existing water control facilities in order to support the current restoration endpoint levels of flood protection. The CERP, as authorized by Congress in WRDA 2000, is the consensus plan that is to be used to modify and improve the C&SF Project to benefit the South Florida Ecosystem and to help provide for the water needs of the south Florida region, including water supply and flood protection.

Severe flooding occurred within areas of Miami-Dade County as a result of Hurricane Irene in October 1999 and intense rainfall in October 2000. In response to the October 2000 flood, the executive director of the SFWMD appointed a Recovery Task Force under the auspices of the Emergency Operations Center to develop a list of proposed flood mitigation projects for the impacted areas of Miami-Dade County. This Task Force has recommended that mitigation projects be considered on a basin-wide basis and include improvements to both the primary and secondary stormwater conveyance systems. A Miami-Dade County Flooding Task Force, which also was created in response to these events, made recommendations that included the expeditious completion of the Modified Water Deliveries and C-111 Projects to help alleviate the flooding risk. Although none of the recommendations are designed to "flood-proof" the basins in which they are constructed, the projects should provide for increased primary system conveyance, which will then allow flood mitigation benefits from secondary system improvements provided by local communities.

In order to prevent this redistribution of water from adversely affecting existing development in the overall Modified Water Deliveries to ENP project area, several mitigation features are included in the plan. The East Everglades residential area also referred to as the 8.5 square mile area (8.5 SMA) was provided with perimeter levees and a seepage collector canal. A new pump station S-357 was constructed and will remove water from the seepage collector canal to prevent increased water levels inside the 8.5 SMA after project implementation (i.e. flood mitigation). Construction was completed in 2008 relative to flood mitigation for the 8.5 SMA (interior canal, western perimeter levee and the S-357 pump station) and all lands have been acquired in the project area. Work continues on land preparations necessary for operations.

Efforts to maintain flood protection can also impact water supply. The C&SF Project provides flood protection by discharging water into the coastal waters through canals. That water therefore is made unavailable for water supply. As flood protection is provided for the agricultural and urban areas bordering the Everglades, there is the potential for increasing the loss of freshwater supplies. Some components of the CERP are designed to decrease this loss.

Herbert Hoover Dike Rehabilitation

The Herbert Hoover Dike (HHD) system consists of approximately 143 miles of levee surrounding Lake Okeechobee, with 19 culverts, hurricane gates, and other water control structures. The first embankments around Lake Okeechobee were constructed by local interest from sand and muck, circa 1915. Hurricane tides overtopped the original embankments in 1926 and 1928 causing over 3,000 deaths. The River and Harbor Act of 1930 authorized the construction of 67.8 miles of levee along the south shore of the lake and 15.7 miles of levee along the north shore. The USACE constructed the levees between 1932 and 1938 with crest heights ranging from +32 to +35 feet, National Geodetic Vertical Datum (NGVD).

A major hurricane in 1947 prompted the need for additional flood protection work. As a result, Congress passed the Flood Control Act of 1948 authorizing the first phase of the C&SF Project. By the late 1960's

the new dike system was completed, raising the elevation of the levees to +41 feet, NGVD. That provided protection to the Standard Project Flood level, an event occurring approximately once in 935 years.

However, investigations conducted in the 1980's and early 1990's of the dike system's potential seepage and stability problems resulted in the identification of two major areas of concern: the seepage and embankment stability at the culvert locations, and the problematic foundation conditions of the dike. During high water events piping is experienced through the levee. In 1999, the USACE developed a plan to rehabilitate the HDD and the plan was approved in 2000. This rehabilitation work covers the entire dike.

How This Subgoal Will Be Implemented

Public works construction. 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 large-scale projects, such as the C-111 Project, consist of structural and nonstructural modifications to existing works intended in part to maintain flood protection. Opportunities to provide greater levels of flood protection or to provide flood protection in areas where there is currently no flood protection may be considered during implementation of the CERP, provided that the greater level of protection or the provision of new flood protection is consistent with the goals and purposes of the CERP and is economically justified.

Additional flood protection is provided by projects partially funded by the Federal Emergency Management Agency (FEMA), including the C-4 Basin Flood Mitigation Project. This project, which was completed in 2007 and is administered by the SFWMD, will improve canals in the C-4 basin and provide storage in an emergency water impoundment to hold excess canal water when canals reach critical capacity.

Nonstructural flood protection. Numerous nonstructural options for flood protection exist for the built environment. These include, but are not limited to, 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.

Long-Term Operations and Maintenance Needs

The SFWMD implements an ongoing Canal Conveyance Capacity Program to evaluate the maintenance, dredging, and bank stabilization requirements of the C&SF Project. This program is intended to restore the original design capacity of the canals as constructed. The SFWMD's Capital Maintenance Program evaluates and implements refurbishment and/or replacement of existing water control structures and pumping stations that have reached the end of their design life. Exotic and aquatic plant control, through herbicidal, mechanical, and biological control methods, is another means of ensuring that conveyance capacity within canals and water bodies is maintained to their original capacity.

Factors Affecting Achievement of this Subgoal

Unanticipated growth. Population growth and changes in land use, especially if different from what is projected, will continue to affect the capability of state and federal agencies to provide flood protection for natural, urban, and agricultural lands. Land conversions to different uses are particularly stressful to the flood protection system, since the flood protection requirements may vary greatly among different uses.

The increase in developed areas to accommodate population growth within the drainage basin of the C&SF Project may increase surface runoff, lowering the level of service for flood protection and increasing the intensity and duration of floods.

Funding. Continued financial support from Congress and the Florida Legislature will be necessary to complete projects for timely achievement of flood protection goals.

Specific, Measurable Objectives for Achieving this Subgoal

~~One~~ Two objectives for achieving this subgoal ~~has~~ have been adopted by the Task Force:

- Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments,
- Rehabilitate the Herbert Hoover Dike to provide adequate levels of flood protection to the communities and lands surrounding Lake Okeechobee

The key projects needed to achieve this objective and the schedule for its implementation are shown in Strategic Plan Table 8.

Strategic Plan Table 8 – Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration

3-B Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
Objective 3-B.1: Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments	Project ID	Project Endpoint	Project
	3600	2013	C-4 Basin Flood Mitigation Projects
	1300	2014	Canal 111
Objective 3-B.2: Rehabilitate the Herbert Hoover Dike to provide adequate levels of flood protection to the communities and lands surrounding Lake Okeechobee	3700	2025	Herbert Hoover Dike Rehabilitation

Subgoal 3-C: Provide Sufficient Water Resources for 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 and for existing and future “reasonable-beneficial” potable, industrial, and agricultural uses. For protection of the natural system, Florida law directs the SFWMD to set minimum flows and levels (MFLs) to prevent significant harm to water resources. MFLs have been established for ENP, the WCAs, Lake Okeechobee, and the northern Biscayne aquifer (except that portion of the aquifer located in southern Miami-Dade County). MFLs also have been established for the Caloosahatchee River and Estuary, Lake Istokpoga, the Lower West Coast Aquifer System, the St. Lucie River and Estuary, and the Northwest Fork of the Loxahatchee River.

WRDA 2000 (attached as Appendix D) requires water reservations for the protection of fish and wildlife in natural systems pursuant to state and federal laws associated with implementation of the CERP. Additionally, WRDA 2000, through the Savings Clause, prohibits the elimination or transfer of existing legal sources of water until a new source of water supply of comparable quantity and quality as that available on December 11, 2000 is available to replace the water that will be lost as a result of CERP implementation.

How This Subgoal Will Be Implemented

As water storage and other water supply related projects and programs are implemented, reliable sources of water identified for human supplies will become available to meet projected demands on a regular basis. The potential for water shortages will be reduced as projects are completed.

Restoration partners support the state's strong commitment to achieving its water supply goals through a variety of additional state and local efforts. Some of these efforts are reflected under other strategic goals and subgoals. Efforts unique to this subgoal are described below.

Implement a process of reserving water through time that will meet the needs of the natural system. WRDA 2000 requires the State of Florida to reserve the water generated by the CERP and needed for Everglades restoration. The SFWMD, consistent with its water management responsibilities, is working to fulfill that commitment.

The SFWMD will also identify existing water supplies for the protection of fish and wildlife for key natural systems (e.g. Everglades, WCAs, and estuaries). This will provide information needed to make future decisions about consumptive use permits.

The SFWMD Governing Board has developed guiding principles for reviewing permit applications dependent upon C&SF Project deliveries and recharge to ensure consistency with the CERP. These will complement the "B" list consumptive use permitting rules that limit permit durations for increased withdrawals that affect the regional system water supplies. This document was accepted by the SFWMD Governing Board in June 2003. Guidance Memoranda, required by the Federal Programmatic Regulations, are being developed which further detail the process and methodology for identifying water to be managed and reserved for the natural system.

Implement the recommendations of the 2002 Water Conservation Initiative Report. The SFWMD is updating the 1993 Water Conservation Rule for Public Water Supplies to bring Rule 40E-2, F.A.C. Basis of Review for Water Conservation in line with Chapter 62-40, F.A.C. at the request of the DEP. The rule will establish a goal-based water conservation approach for water utilities. An analytical web-based tool has been developed by the DEP and the water management districts to assist utilities in creating water conservation plans, which through the new rule will become part of the utility's consumptive use permit. These plans will be designed to be both cost effective and tailored to the use characteristics of the individual utility's service area. The rule will enhance the SFWMD's ability to achieve efficient levels of water use and enhance other ongoing conservation efforts focused on public outreach, cooperative grant funding, and technical assistance.

Implement and update regional water supply plans. Regional water supply plans with twenty-year planning horizons, which reassess base assumptions and current technologies every five years, have been completed for each of the four SFWMD regional water supply planning areas: Lower East Coast, Upper East Coast, Kissimmee Basin, and Lower West Coast. The goal of each plan is to meet the water supply needs of the region during a one-in-ten-year drought while not causing harm to the environment. The water supply plans include strategies for (1) increasing supply for natural systems and the human population through water resource development projects, (2) promoting the use of alternative water supply sources and conservation, (3) protecting water quality at the source of supply, (4) accurately reflecting limitations of the available groundwater or other available water supplies in plans for future growth and development, (5) increasing the available water supply, and (6) protecting natural systems from harm through the consumptive use permitting process, from significant harm through establishment of minimum flows and levels, and from serious harm through proper implementation of water shortage plans.

Improve water conservation and reuse. The SFWMD regional water supply plans outline the planning and permitting efforts needed to encourage water conservation and lower consumptive use rates over time. Strategies to improve conservation and reuse incorporate different approaches for public, commercial, landscape, and agricultural consumers. These strategies include limits on the time of day irrigation is allowed, inverted rate structures, xeriscape landscaping using native plants, establishment of mobile irrigation labs, grants to implement conservation projects, and feasibility analyses for using reclaimed water. A strong public education program supports these strategies.

Increase water resources through alternative water supply development and water resource development projects. The SFWMD has implemented programs with goals to increase the amount of available water. These programs have been in place for some time and are often in addition to the projects in the CERP. The Alternative Water Supply Development Program awards grants to local water providers to develop additional water supply through alternative technologies. Through its Water Resource Development Projects, the SFWMD attempts to increase the regional water resources available for natural and built environment needs.

Establish minimum flows and levels for priority water bodies. The SFWMD is working to establish minimum flows and levels for priority water bodies according to the annual DEP approved schedule. This will improve the efficiencies of delivering water and maximizing available resources.

Factors Affecting Achievement of this Subgoal

Unanticipated growth. If population growth and/or water used for irrigation exceed projections, variations in growth projections will be incorporated into the five-year updates of the regional water supply plans.

Funding. Adequate funding will be required to accomplish water storage and other water supply related projects. Likewise, adequate funding of public outreach and education will be critical to achieving water conservation strategies and reduced consumption rates. Efforts to encourage partnerships that promote and enhance local government programs to develop and implement alternative water supply resources will be important to achieving water supply goals.

Specific, Measurable Objectives for Achieving this Subgoal

Three objectives for achieving this subgoal have been adopted by the Task Force:

- Plan for regional water supply needs
- Increase volumes of reuse on a regional basis
- Increase water made available through the [state's Water Protection and Sustainability Program](#) and the SFWMD Alternative Water Supply Development Program

The key projects needed to achieve these objectives and the schedule for their implementation are shown in Strategic Plan Table 9.

Strategic Plan Table 9 – Subgoal 3-C: Provide Sufficient Water Resources for Built and Natural Systems

3-C Milestone Projects (Refer to Appendix A for more information about project schedules, funding, responsible agencies, etc.)			
3-C.1: Plan for regional water supply needs	Project ID	Restoration Endpoint	Project
	3800	2008	Regional Water Supply Plans (Formerly Project ID 3704)
3-C.2: Increase volumes of reuse on a regional basis	Project ID	Restoration Endpoint	Project
	3900	2025	C&SF: CERP – South Miami-Dade County Reuse (CERP Project WBS# 98) (Formerly Project ID 3800)
	3901	2025	C&SF:CERP – West Miami-Dade County Reuse (CERP Project WBS# 97) (Formerly Project ID 3801)
	3902	2020	C&SF: CERP Wastewater Reuse Technology Pilot (CERP Project WBS# 37) (Formerly Project ID 3802)
3-C.3: Increase water made available through the State’s Water Protection and Sustainability Program and the SFWMD Alternative Water Supply Development Program	Project ID	Restoration Endpoint	Project
	4000	Ongoing	Alternative Water Supply Grant (Formerly Project ID 3900)

Linkages between Strategic Work Efforts and Ecosystem Restoration

The Task Force members measure progress on two complementary scales: (1) scales that measure the satisfactory completion of work and (2) scales that measure ecosystem health (in terms of either stressors, ecological conditions, or other water-related needs). ~~With~~ ~~Using~~ these two ~~scales~~ ~~metrics~~ the Task Force distinguishes between ~~these things~~ ~~factors~~ that are within people's capability to manipulate and control (the strategic goals, subgoals, and objectives) and those ~~things~~ that ~~are result from~~ the responses of natural systems (indicators and restoration endpoints) to the Task Force agencies' efforts.

No exclusive linkage exists between any one strategic goal or objective (let alone, any one specific project) and any one indicator of ecological conditions. Efforts on many fronts will be necessary to restore and sustain a healthy ecosystem, which will then be manifested through a myriad of species and processes. However, positive correlations are expected between individual indicators of ecological conditions and groups of projects designed to eliminate or mitigate stressors that are detrimental to those indicators. Some of these relationships were charted in a previous table 2004 Strategy. This table will be revised following the 2008 update of the System-wide Indicators.

The Task Force believes that the ecosystem will respond with improved health and vigor to efforts to reverse disruptive human influences. Due to the complexity and large scope of this effort, the agencies involved in restoration continue to improve their understanding of how restoration will occur. This understanding is critical to the ability to accurately assess the major stressors on the various components of the ecosystem and consider how the physical improvements expected to result from projects designed to eliminate or mitigate stressors will affect ecological conditions and other water-related needs. Relationships between projects and the elimination or mitigation of stressors will be more direct than relationships between projects and resulting ecological conditions; however, even these relationships cannot yet be accurately predicted with current ecological models.

The monitoring and assessment complexities cited above pose challenges, but the monitoring conducted to date has provided good information that has been useful in assessing the success of early restoration efforts. For example, in response to the reestablishment of more natural flow characteristics in the Kissimmee River, accomplished through the implementation of the Kissimmee River Restoration Project, wetland vegetation, particularly broadleaf marsh species and buttonbush, is rapidly expanding within the re-flooded floodplain. Recent observations indicate that the reconstructed section of river channel has received increased use by wading bird species, particularly snowy egrets, white ibis, tricolored herons, wood storks, and black crowned night herons. Other notable bird observations in this region include roseate spoonbills and whooping cranes. This is one localized and general example of how the ecosystem is responding to work efforts that eliminate or mitigate disruptive human influences.

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BIENNIAL REPORT BACKGROUND AND PURPOSE
ACTIVITIES, PRIORITIES, POLICIES, STRATEGIES, PLANS, PROGRAMS,
AND PROJECTS: JULY ~~2004-2006~~ THROUGH JUNE ~~2006~~2008
MEASURING PROGRESS TOWARD RESTORATION

TRACKING SUCCESS:

BIENNIAL REPORT OF THE SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

July ~~2004-2006~~ - June ~~2006~~2008

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TRACKING SUCCESS: BIENNIAL REPORT OF THE SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

July 2006 - June 2008

BIENNIAL REPORT BACKGROUND AND PURPOSE

Background

The Water Resources Development Act (WRDA) of 1996 established the intergovernmental South Florida Ecosystem Restoration Task Force (Task Force). ~~The Task Force~~ consists of fourteen members from four sovereign entities: seven federal agency representatives at the assistant secretary or equivalent level, five state representatives, and two Native American Indian representatives. Among other duties, WRDA 1996 requires the Task Force to:

- Coordinate the development of consistent strategies, policies, projects, and programs to address the restoration, preservation, and protection of the South Florida Ecosystem
- Exchange information on Everglades restoration efforts
- Coordinate scientific research
- Facilitate the resolution of interagency and intergovernmental disputes
- Facilitate participation by the public

The Task Force facilitates the coordination of conservation and restoration efforts implemented through a combination of federal, state, local, and tribal initiatives in south Florida. The Comprehensive Everglades Restoration Plan (CERP) is the single largest initiative. The Programmatic Regulations for the CERP require consultation with the Task Force on specific program and project activities. The Task Force also provides opportunities to improve cohesion among public interest groups on the disparate elements and programs of the South Florida Ecosystem restoration (land acquisition and conservation, water quality improvement, water infrastructure development, and habitat protection). 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.

A Working Group and Science Coordination Group (SCG) have been established to assist the Task Force in accomplishing its duties. The SCG supports the Task Force in its efforts to coordinate the scientific aspects of restoration of the South Florida ecosystem. The SCG's ~~primary task is is primarily tasked with~~ continually documenting and supporting the programmatic-level science and other research through updates and implementation of the Task Force's Plan for Coordinating Science. To enhance the integration of science and management, the SCG includes both senior managers and scientists.

The Working Group assists the Task Force in its efforts 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. It also prepares draft coordination documents for Task Force review. The Working Group establishes issue based teams and regional coordination teams as necessary to address specific issues and to facilitate regional coordination in specific ~~regions~~areas. The current active teams are listed in the following paragraphs. Advisory groups, such as the Water Resources Advisory Commission (WRAC), provide the Task Force with recommendations on specific issues.

Issue Based Teams:

The Noxious Exotic Weed Task Team (NEWTT) coordinates the implementation of the Working Group Assessment and Strategic Plan for managing invasive exotic plants in south Florida.

The Florida Invasive Animal Task Team (FIATT) helps organize, coordinate, and plan for invasive exotic animal issues of interest to the Restoration Initiative and serves in an advisory capacity to member organizations and institutions.

The Land Acquisition Task Team develops the annual updates to the land acquisition strategy. It describes the lands identified jointly by federal and state agencies for ecosystem restoration, and with its appendices, provides a broad picture of all land acquisition initiatives that contribute to the restoration.

Regional Restoration Coordination Teams:

The Biscayne Bay Regional Restoration Coordination Team provides a forum for public involvement and outreach for activities, programs, and projects affecting Biscayne Bay. The team consists of members representing public interests and agencies. The team has developed an Action Plan for improving the health of Biscayne Bay through coordination and cooperation of the members of the team. The team serves as the principle advisory body to the Working Group on Biscayne Bay.

The Southwest Florida Regional Restoration Coordination Team integrates, coordinates, and evaluates the southwest region's environmental restoration activities, and makes recommendations to the Working Group as appropriate. Additionally, the team promotes public outreach and involvement. The team serves as the principle advisory body to the Working Group on southwest Florida.

Advisory Groups:

The South Florida Water Management District (SFWMD) Governing Board appointed the 48-member WRAC in March 2001 to provide a forum for discussion of Everglades restoration and critical water resource issues in south Florida and to provide consensus recommendations to the Governing Board. The Task Force designated the WRAC as a public interest advisory body in 2002. The WRAC has met every month, except for the month of August, since its creation and has met annually with the Task Force to discuss issues of mutual interest. In addition, the Governing Board has appointed a WRAC Lake Okeechobee Committee, which meets monthly, and the WRAC also hosts "Issues Workshops" each month on a wide variety of water resource, water supply, and South Florida Ecosystem restoration topics. Recommendations from the issues workshops are made to the full WRAC.

Purpose

This report summarizes the activities, priorities, policies, strategies, plans, programs, and projects of the Task Force for the reporting years July 2006 – June 2008.¹⁰ WRDA 1996 directs the Task Force to report to the Congress biennially on:

- The activities of the Task Force for the reporting years
- Activities, priorities, policies, strategies, plans, programs, and projects planned, developed, or implemented for South Florida Ecosystem restoration
- Progress made toward restoration

The *Biennial Report of the South Florida Ecosystem Restoration Task Force (Biennial Report)* documents activities and progress and describes how funds are targeted for restoration. It satisfies the WRDA 2000 requirements by providing the following information: First, it summarizes the activities and major accomplishments of the reporting period in terms of the activities, priorities, policies, strategies, plans, programs, and projects that were developed or conducted to carry out the specific strategic goals and objectives adopted by the Task Force members and the Task Force. Second, it tracks the progress made toward restoration during the reporting period in terms of selected measurable indicators of ecosystem health.

The indicators of success tracked in previous biennial reports have been revised and are outlined in this document.

This *Biennial Report* is intended for four principal audiences:

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

This information and other reports are broadly shared with state and federal agencies, local governments, regional agencies, industries, private interest groups, and private citizens interested in South Florida Ecosystem restoration and will be made available on its website: http://www.sfrestore.org/documents/work_products.html.

¹⁰ The Task Force member agencies operate within various fiscal year periods. All the federal agencies and the South Florida Water Management District operate within a fiscal year that begins on October 1 and ends on September 30 of each year. The State of Florida agencies operate within a fiscal year that starts on July 1 and ends on June 30 of each year. Any annual dollar amounts included in this report apply to each agency's fiscal year. Pertinent footnotes are provided for these data.

ACTIVITIES, PRIORITIES, POLICIES, STRATEGIES, PLANS, PROGRAMS, AND PROJECTS: JULY 2006 THROUGH JUNE 2008

Intergovernmental Coordination

The Task Force documents the major aspects of its intergovernmental coordination efforts through a number of reports that are described below. Additional coordination efforts include regular meetings of the Task Force, Working [Group](#), and advisory teams, and field trips that provide an experiential view of ecosystem restoration.

Coordination Reports

Strategy - Coordinating Success: Strategy for Restoration of the South Florida Ecosystem provides a comprehensive discussion of the principles and strategies adopted by the Task Force, along with the major plans, programs, and projects of the various Task Force member agencies. Prepared every two years the *Strategy* identifies strategic goals, subgoals, and measurable objectives that have been adopted by the Task Force member agencies, along with schedules for their accomplishment. It also outlines how progress will be measured through a suite of System-wide Indicators.

Biennial Report - Tracking Success: The Biennial Report summarizes the major activities of the Task Force and its members during the past two years. It describes progress made toward each strategic goal and objective during the two-year reporting period and assesses the status of the System-wide Indicators.

Integrated Financial Plan - Each year the Task Force publishes an *Integrated Financial Plan* (IFP) which provides individual project sheets for each of the federal, state, tribal, and local restoration projects that contribute to the accomplishment of the vision, goals, subgoals, and objectives of the Task Force.

Land Acquisition Strategy - The Task Force publishes an annual *Land Acquisition Strategy* that describes the strategy for land acquisition needed for ecosystem restoration projects that are funded in part or wholly by the federal government. Along with the appendices it provides a broad picture of all land acquisition initiatives that contribute to the restoration.

Plan for Coordinating Science - The Task Force prepares a biennial *Plan for Coordinating Science* (PCS). This plan documents the framework for coordinating science at a strategic meta-agency level, pulling science activities together to enhance agency coordination and cooperation, and communicates strategic level science priorities and system-wide assessments for restoration success.

Coordination Meetings

The Task Force and its subgroups conducted 54 meetings for the purpose of intergovernmental coordination during the reporting period. To promote dynamic interaction at Task Force meetings, agendas and read ahead materials are distributed to the members and posted on the Task Force website (www.sfrestore.org) two weeks in advance of each meeting. Access to agendas and handouts from previous meetings as well as current and historic documents are available on the website. Task Force agendas include a short synopsis of the purpose, objectives, and key issues for each agenda item. Written evaluation forms for each Task Force meeting are used to improve the next meeting.

During the reporting period the Task Force undertook a comprehensive review of the strategic subgoals and objectives. The review was conducted by the Working Group to update areas of the strategic goals that have evolved due to advances in restoration science or technology and to better capture programs and policies within the goal three areas. The review was conducted in an open and transparent process with broad input from the public and the WRAC. The Task Force adopted the revised subgoals and objectives in December 2007.

In accordance with the Programmatic Regulations the [U.S. Army Corps of Engineers \(USACE\)](#) consults with the Task Force on CERP projects and programmatic requirements. Project consultation with the Task Force generally takes place at three stages in the development of a Project Implementation Report (PIR): [the scoping phase](#), [the development of alternatives development](#) phase, and [during the](#) final draft PIR. The Task Force has delegated the scoping and alternative formulation ~~PIR~~ consultations to the Working Group. The following consultations took place during the reporting period: Interim Goals and Targets, Lake Okeechobee Watershed PIR (Alternative Formulation Briefing [AFB]), Melaleuca Eradication [and Other Exotic Plants](#) PIR (Scoping), C-43 PIR, ~~Integrated Delivery Schedule, Guidance Memoranda~~, ENP Seepage Management PIR (Scoping), L-31/L-30 Seepage Management Draft Pilot Project Design Report, Winsberg Farms Wetlands Restoration Draft PIR, and C-111 Spreader Canal PIR (AFB). [In addition to these project specific consultations, programmatic guidance consultations occurred regarding the development of the Integrated Delivery Schedule and Guidance Memoranda.](#)

Field Trips

During the reporting period the Task Force began organizing field trips before each meeting. These trips are designed to provide the members and the public with first hand observations of key elements of the ecosystem, projects, and their role in accomplishing restoration goals and objectives. The field trips cover a diverse array of locations, issues, and conditions to inform future decision-making on Task Force issues. [Six field trips took place during the reporting period.](#)

The Task Force field trip in March 2007 highlighted the Kissimmee River Restoration Project. The pontoon boat tour of a restored portion of the river illustrated how the project will help accomplish Goal 1 by removing impediments to flow and benefit Goal 2 by restoring floodplain wetlands. In May 2007, the Task Force visited the Everglades Agricultural Area which covers portions of Palm Beach, Martin, Hendry, and Glades counties. Several projects are underway or planned that focus on water storage and water quality (Goal 1). The September 2007 field trip discussed several restoration projects in western Miami-Dade County that focus on the distribution of water (Goal 1), including Modified Water Deliveries [to Everglades National Park \(ENP\)](#) and the Tamiami Trail. An up close encounter with a large, recently captured Burmese python highlighted the challenge of removing invasive exotic species from the ecosystem (Goal 2). The December 2007 field trip highlighted Biscayne Bay and provided an overview of the natural systems and management challenges (Goals 1, 2, and 3) faced by Biscayne National Park and the Biscayne Bay Aquatic Preserve. The March 2008 Lake Okeechobee and Herbert Hoover Dike field trip reiterated how the lake's health and management are key to restoration of the entire South Florida Ecosystem. Its 730 square miles provide fresh water (Goal 1), habitat (Goal 2), and recreational opportunities (Goal 3). The field trip in May 2008 focused on the water quality benefits of stormwater treatment areas including the roles and applications of scientific research and periphyton (Goal 1).

Coordination of Strategic Science Issues

The restoration of the South Florida Ecosystem involves a large and complex combination of initiatives intended to return the degraded ecosystem to a more natural and sustainable condition. This large interwoven complex of restoration programs and projects requires a long-term process that involves the resolution of innumerable scientific, engineering, management, and policy issues. Continual improvements are needed in plans and designs that incorporate new information, science, and lessons learned as restoration progresses.

Congress established the Task Force to coordinate this complex mix of programs and projects being planned and implemented by the various federal, state, and tribal organizations. Most Task Force member organizations have science programs that may operate both individually and collectively to provide technical information to support restoration decisions aligned with Task Force goals.

The Task Force established the SCG to help it coordinate science and research at a meta-agency level. Good management decisions require a sound scientific understanding of the ecosystem. To enhance the integration of science and management the SCG includes both senior managers and scientists. Based on direction from the Task

Force and input from Congress and GAO, the SCG has concentrated on two significant science coordination tasks to date: the development and refinement of a *Plan for Coordinating Science* and the creation and assessment of a suite of system-wide wide indicators. Additionally, NEWTT and FIATT have focused on the issue of invasive exotic species.

Plan for Coordinating Science

The initial Plan for Coordinating Science was approved by the Task Force in 2004. The latest draft Plan for Coordinating Science includes advances in our collective understanding since 2004 and incorporates a highly sophisticated framework for integrating strategic science issues, for pulling science activities together to enhance agency coordination and cooperation, and to communicate strategic level science priorities and system-wide assessments for restoration success.

Four fundamental premises helped frame development of the Plan:

1. Because of the complex nature of the subtropical systems in south Florida, and because they have been substantially altered by human stresses, the responses of these systems to restoration plans are difficult to predict with high levels of certainty and ecological indicators are a key element to reduce uncertainty and assess restoration success;
2. Because these natural systems are continuing to deteriorate due to on-going human stresses, active and aggressive restoration initiatives should proceed even though there is some scientific uncertainty, as long as there is sufficient science to assess the performance of the proposed project;
3. A highly prioritized and focused science program with carefully defined system-wide ecological indicators will over time substantially reduce current levels of scientific uncertainty, and improve our confidence in the correctness of restoration plans; and
4. The combination of a program of adaptive management with a program of focused science that includes research, monitoring, predictive tools, and system-wide ecological indicators will provide the most effective long-term strategy for actively moving forward with restoration initiatives.

System-wide Indicators

A suite of 14 system-wide indicators was developed in an open and transparent process, and independently reviewed and then approved by the Task Force in 2006. The indicators are organized into ecological and compatibility categories. The compatibility indicators are used to assess the impact of restoration activities on the adjacent built systems (agriculture and development).

Since 2006 the SCG has coordinated a common format for assessing and communicating the scientific and management aspects of the suite of indicators. In 2008 this approach was approved by the Task Force and adopted by the REstoration COordination and VERification (RECOVER) team for future CERP reports. The approach provides direct and transparent link from the underlying data and hypothesis to a set of easy to understand stop light assessments.

Invasive Exotic Species

Another science issue that is being addressed in a coordinated and strategic manner is invasive exotic species. Invasive species were identified by the Task Force as an important restoration concern at the beginning of the Everglades restoration initiative. The Task Force has two exotic species organizations, the Noxious Exotic Weed Task Team (NEWTT) and the Florida Invasive Animal Task Team (FIATT). FIATT is developing a non-native animal report to provide a broad picture of the status of exotic animal species in south Florida. It will focus on the agencies, along with their respective departments, that are represented on the Working Group. FIATT has established draft invasive animal lists by taxonomic groups developed from previous reports (e.g., Carole Goodyear's 2000 *Exotic Animal Report*), peer review, input from FIATT members, survey results, and interviews with member agencies and natural area managers throughout south Florida. FIATT is also completing a list of priority animal species.

Exchange of Information

The information provided at meetings, during the field trips and posted on the [Task Force](#) website collectively provides a broad overview of the key restoration issues in the South Florida Ecosystem. This information keeps the members and the public informed of key and timely issues and provides the implementing agencies with member and public feedback on their plans and projects. Key items presented during the reporting period include: algal blooms in Florida Bay, land conservation tools in Florida, the status of land acquisitions, the status of projects, Lake Okeechobee Regulation Schedule, adaptive management, measuring success, issues affecting threatened and endangered species, drought, invasive exotic plants and animals, system-wide and basin by basin challenges, and water quality reports (REMAP).

In addition to the reports, Task Force staff coordinates the preparation or prepares handouts, fact sheets, and brochures. As an example the entire suite of updated subgoals and objectives that were adopted by the Task Force in 2007 has been summarized in a one-page strategy brochure. This approach provides a broad variety of readers with an easy to read summary of the current restoration goals and objectives.

In May 2007, the Task Force initiated a quarterly *E-Update* to provide the members and the public with quick updates and reminders. The lead article highlights the most recent Task Force field trip and highlights its relationship to the strategic goals and objectives. Brief articles, updates on members and a schedule of upcoming meetings are included. The Task Force homepage has a link to the most current *E-Update* as well as archived issues for reference.

Facilitation and Conflict Resolution

One of the Task Force's responsibilities according to WRDA 1996 is to facilitate the resolution of interagency and intergovernmental conflicts associated with the restoration of the South Florida Ecosystem. The Task Force has established consensus voting protocols to outline the procedures used to decide final actions, reports, and recommendations. The Task Force always seeks consensus before taking a final action. When unanimous consensus is not possible a two thirds majority vote of the members present is sufficient for a final action. When this occurs the dissenting members shall have the opportunity to submit a concise minority report to accompany the majority document.

Where possible the Task Force seeks to minimize conflict by identifying and addressing critical issues before they become highly contentious. In instances where a contentious issue began before the establishment of the Task Force or arises otherwise, the Task Force will often use an advisory group with facilitated support or an independent group of experts.

Avian Ecology

In August 2007, the Sustainable Ecosystems Institute (SEI) convened an Avian Ecology Workshop that included an avian/ecosystem review panel to address the ecology and management of the federally listed endangered Cape Sable seaside sparrow, Everglade snail kite, and wood stork, and state listed roseate spoonbill, in relation to Everglades restoration. The effort was sanctioned by the Task Force and built on a previous Avian Ecology Workshop, held in March 2003 (SEI 2003).

The review and workshop format was based on the SEI process. This is an open and transparent science review method to help managers use the best science available when making critical decisions for species, their habitats, and entire ecosystems. The process has been used to resolve critical and controversial science based issues regarding endangered species, and the restoration and management of ecosystems.

Panel Charge. The goal of the workshop was to review new information gathered on the four species of concern and to provide scientific clarity to help allow managers to move forward with restoration. The overall charge to SEI and the panel was to review the scientific information on the four species in a multi-species framework with

respect to restoration. Thus, the science is viewed in light of natural processes, the current state of the ecosystem (resulting from natural events and human actions), and in the context of the steps that will be taken to restore a more natural system.

Science Forum. On August 13-15th, 2007, at Florida International University, SEI assembled the panel of experts, scientists whose work has contributed to our knowledge of the species and system, decision-makers, and other interested stakeholders. Reflecting the breadth of issues, the panel consisted of avian ecologists with expertise in the relevant species and issues, vegetation experts, hydrologists, and an expert in ecosystem change/climate change.

Prior to the workshop, SEI contacted stakeholders to identify key information gaps and to gain insight on relevant issues involving these species and restoration. The panel was provided with relevant written reports and scientific peer-reviewed publications for background information. Copies of the scientific presentations, digital voice recordings, and forum summary are available from SEI. A DVD copy of the webcast is available through the Task Force.

Final Report. SEI presented its report to the Task Force at its December 2007 meeting. Based upon discussion with the Task Force members, comments from the public and subsequent input from the members a final report was prepared. A copy of the final report is available on the SEI website at <http://www.sei.org/everglades/reports.htm>.

Public Participation and Access

The Task Force took a number of steps to improve public participation and access during the reporting period. All of the 54 meetings and 5 conference calls conducted by the Task Force and its subgroups were publicly noticed and included opportunities for the public to share their views on current issues.

Continuous improvements are being made to the Task Force website. Interested members of the public can sign up for automatic e-mail updates via the website to provide the latest Task Force information. Agendas and read ahead materials are posted on the website in advance of the meetings. Current and historic meeting information as well as important documents and reports are also available to anyone with internet access.

During this reporting period the Task Force began a new dynamic public participation process as a part of each meeting. Public comment is taken during each substantive agenda item as well as during the general public comment period. This allows for public comment to be heard in connection with Task Force discussion on each agenda item and for discourse between Task Force members and the public to occur.

The addition of field trips, more interactive public involvement during the meetings and improvements to information available to the public on the website has improved public participation in the restoration process and provide an enriched experience for the public in attendance at Task Force meetings.

Water Resources Advisory Commission (WRAC)

In 2006, the WRAC recommended that the SFWMD Strategic Plan emphasize restoring Biscayne and Florida Bays, and adding more water storage to protect Lake Okeechobee and the Caloosahatchee and St. Lucie Estuaries. In 2006, the WRAC also made recommendations to the SFWMD Governing Board on topics including: moving forward with the design and implementation of five expedited restoration projects; changes to the federal "Draft Interim Goals and Targets Agreement"; adjustments to the Lake Okeechobee Regulation Schedule to protect the downstream estuaries; and recommended that the USACE work with the SFWMD staff and DCA on studies and emergency planning for the Herbert Hoover Dike. The WRAC also recommended approval of the Upper East Coast, Lower West Coast, and Kissimmee Basin Water Supply Plans, and endorsed the Fiscal Year (FY) 2006 Alternative Water Supply Program (80 projects funded for \$43.1 million). The WRAC reviewed and recommended moving forward with revisions to the "Long Term Plan to Improve Water Quality" and enhancements to the

Stormwater Treatment Areas. The WRAC recommended several improvements to programs regarding public access and recreational use of SFWMD lands.

In 2007, the WRAC recommended a draft Regional Water Availability Rule, a draft Lower East Coast Water Supply Plan, and in addition to improvements to public access and recreational use of SFWMD lands, the WRAC reviewed and made recommendations about the ENP Draft General Management Plan. The WRAC recommended moving forward with the C-111 Spreader Canal and Compartment C designs; recommended the Governing Board approve a document entitled "Clarifying State Assurances for Acceler8 Projects"; supported state legislation to improve Lake Okeechobee and Caloosahatchee and St. Lucie Estuary protection; and made recommendations about the Lake Okeechobee Regulation Schedule and Lake Okeechobee Service Area Water Availability. The WRAC also hosted a "Water Summit" to explore short-term water management challenges. This public forum focused on the constraints and limits regarding Lake Okeechobee Operations and water levels. The WRAC also convened a public "Water Conservation Summit" and stakeholder input process to develop a comprehensive and enduring water conservation program for the region.

In 2008, the WRAC provided comments and recommended the Governing Board approve and forward to the Florida Legislature, the Lake Okeechobee Watershed Construction Project, Phase II Technical Plan; recommended that a statewide Technical Advisory Committee on revising Environmental Resources Permit rules include non-agency representatives; and advised the SFWMD Governing Board that the Statewide Urban Fertilizer rule is a step in the right direction to help reduce nutrient runoff in urban areas, but that more research and public education is needed. The WRAC also recommended that the Governing Board authorize the Florida Fish and Wildlife Conservation Commission to add the 3,700 acre Chandler Slough to the Kissimmee Public Use Area.

Legislative Updates

Water Resources Development Act of 2007. WRDA 2007 (Public Law 110-114) was enacted November 8, 2007. WRDA 2007 contained several key provisions relevant to the South Florida Everglades Ecosystem Restoration (SFEER) program. Sections 1001(14-16) authorized three CERP projects for implementation: Indian River Lagoon-South at a total cost of \$1,365,000,000 (2007 dollars); Picayune Strand Restoration (formerly known as Southern Golden Gate Estates Hydrologic Restoration) at a total cost of \$375,330,000 (2007 dollars); and Site 1 Impoundment at a total cost of \$80,840,000 (2007 dollars).

Section 2003 of WRDA 2007 amended Section 221 of the Flood Control Act of 1970 by establishing requirements for project "Partnership Agreements", clarified in-kind contributions eligible for credit toward non-Federal sponsor cost-shares, and created pre-Project Agreement credit agreements identifying work to be performed by non-Federal interests that are eligible for credit.

Section 2034 of WRDA 2007 established a requirement for independent peer review of project studies. In general, independent peer review is mandatory for projects with a total cost of \$45,000,000; however, independent peer review may also be requested for any project by the Governor of an affected state or the Chief of Engineers. This provision of WRDA 2007 also provides for exceptions to the independent peer review requirement, contains requirements for timing and peer review panel membership, contains direction to the Chief of Engineers with respect to panel recommendations, cost, and cost allocation.

Section 2039 of WRDA 2007 established a requirement for ecosystem restoration studies to include a monitoring plan for monitoring success, and established a 10-year maximum duration of the Federal cost-share.

Title VI ("Florida Everglades") of WRDA 2007 contains several provisions related to the CERP and SFEER programs. Section 6001 modifies a previous WRDA 1999 authorization for the Hillsboro and Okeechobee aquifer storage and recovery projects; Section 6002 increases the authorized cost amount for pilot projects authorized in WRDA 2000; Section 6003 adds a Section 902 (WRDA 1986) adjustment to the "Additional Program Authority" provisions of Section 601(c)(3) of WRDA 2000; Section 6004 modifies the crediting requirements for in-kind credit

performed by the non-Federal sponsor; Section 6005 includes an authorized amount for maximum expenditures for outreach and assistance; Section 6006 increases the overall authorized program cost for Critical Restoration Projects authorized in accordance with section 528 of WRDA 1996 and modifies the federal share amount for individual projects; and Section 6007 provides for the development of a regional engineering model for environmental restoration, including projects to be developed pursuant to Section 601 of WRDA 2000.

While the WRDA authorizes projects, it does not provide Federal funding. Congress provides funding, separately, through the Energy and Water Development Appropriations Act. For a detailed breakout for Federal and State Appropriations see the Cross Cut Budget Working Document at www.sfrestore.org.

CERP Programs and Projects

CERP Programmatic Regulations

The USACE, with the concurrence of the Governor of Florida and the DOI, and in consultation with the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the USEPA, the U. S. Department of Commerce, and other federal, state, and local agencies, published the final rule for the “Programmatic Regulations for the Comprehensive Everglades Restoration Plan” in the *Federal Register* on November 12, 2003. As required by WRDA 2000, the Programmatic Regulations (33CFR Part 385) establish:

- The CERP implementation processes, including the development of PIRs, project coordination agreements, and operating manuals that ensure the CERP goals and objective are achieved
- Processes to ensure that new information, resulting from new or unforeseen circumstances, new scientific or technical information, or from adaptive management, is integrated into CERP implementation
- Processes to ensure the protection of the natural system consistent with CERP goals and purposes, including the establishment of interim goals needed to evaluate success throughout the implementation process

These Programmatic Regulations direct the USACE and the SFWMD, in consultation with DOI, the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, the USEPA, the Department of Commerce, the Florida Department of Environmental Protection (DEP), other federal, state, and local agencies, and the Task Force, to develop:

- A pre-CERP baseline
- Six program-wide guidance memoranda
- A master implementation sequencing plan
- Periodic CERP updates

In accordance with Section 385.6 of the Programmatic Regulations, the USACE initiated a formal review in 2008 (five years after initial approval) to determine whether revisions are necessary to attain the goals and purposes of the CERP. The first step of the review entails scoping of issues and concerns. Notice was placed in the Federal Register on May 20, 2008 and an initial 90-day public comment period ends on August 18, 2008. Public comments were specifically requested on issues concerning the programmatic regulations, items in the regulations that should be reviewed, or suggestions to improve the regulations.

Programmatic Regulations also require the establishment of interim goals and endpoints for the development of the documents noted above. The progress made toward these requirements during the reporting period is summarized below:

Pre-CERP Baseline. The final draft of the pre-CERP Baseline was completed in April 2005. This baseline is defined in the Programmatic Regulations as the existing hydrologic and water quality conditions in the South Florida Ecosystem on the date of enactment of WRDA 2000. Guidance Memo 3 notes that the "Savings Clause" provisions

of the CERP stated that water users would not be made worse off through implementation of CERP as of the baseline date December 11, 2000; and that water users would not be put in competition with one another. A key assumption under the "Savings Clause" was "no harm". The pre-CERP baseline is determined by using a multi-year period of record based on assumptions such as land use, population, water demand, water quality, and assumed operations of the C&SF Project. The baseline is used, along with other analyses, to identify changes from CERP, such as if an existing legal source of water has been eliminated or transferred or if a new source of water is of comparable quality to that which has been transferred.

Each PIR continues to include analyses and considers the operational conditions included in the pre-CERP baseline to demonstrate that the project will not reduce levels of service for flood protection that (1) were in existence on the date of enactment of WRDA 2000 and (2) are in accordance with applicable law. The RECOVER and project teams are continuing to add to the baseline data, filling monitoring and assessment gaps and to provide parameters for comparison during and after CERP modifications to identify changes.

Six Program-Wide Guidance Memoranda. These ~~guidance~~ memoranda, currently in draft form, provide guidance on the general format and content of PIRs; formulation and evaluation of alternatives developed for PIRs; general content of operating manuals; general direction for the assessment activities of RECOVER; instructions for identifying in PIRs the appropriate quantity, timing, and distribution of water to be dedicated and managed for the natural system; and instructions for identifying in PIRs if an elimination or transfer of existing legal source of water will occur as a result of implementation of the CERP. The process to develop the Guidance Memoranda, which are required by the Programmatic Regulations, has been a cooperative effort between the federal and state partners.

During the reporting period, many updates and revisions were suggested for incorporation into the Guidance Memoranda, primarily as a result of lessons learned from project-specific applications of the requirements of the Guidance Memoranda. A "Revised Final Draft Guidance Memoranda" document dated July 2007 was made available for public review and comment beginning in August 2007. The formal public comment period ended December 17, 2007. Comments were received from government agencies and private interests. As required by the CERP Programmatic Regulations, after consideration of comments, the Guidance Memoranda are to be submitted for formal concurrence by the Governor of Florida and the Secretary of the Interior, and subsequent approval by the Secretary of the Army.

There have been some challenges in getting agreement from all parties. Due to the upcoming review and possible revision of the Programmatic Regulations, the USACE temporarily suspended work on the Guidance Memoranda until it is determined whether any revisions to the Programmatic Regulations will necessitate revisions to the Guidance Memoranda.

Master Implementation Sequencing Plan. The initial Master Implementation Sequencing Plan (MISP) was finalized in 2005. This preliminary draft organized CERP project schedules into five-year time bands and was incorporated into the Task Force *Strategy* and the IFP. The MISP includes the sequencing and scheduling of all the CERP projects, including pilot projects and operational elements, based on the best scientific, technical, funding, contracting, and other information available. The MISP identifies a framework for restoration of the South Florida Ecosystem by defining the order in which the many projects within the South Florida Ecosystem restoration program will be planned, designed, and constructed. The MISP is to be reviewed again in 2010 (at least every five years). Interim (work in progress) MISP updates may be utilized during the planning process to examine potential impacts resulting from various project alternatives or scenarios as they are developed and impacts from fiscal year funding limitations.

Integrated Delivery Schedule. Though not required by Programmatic Regulations, the USACE, in coordination with DOI, SFWMD, and DEP, are developing a new project sequencing plan for the south Florida restoration program called the Integrated Delivery Schedule (IDS). The ultimate goal of the Integrated Delivery Schedule is to develop a realistic schedule for achieving restoration benefits as soon as possible consistent with existing state and

federal authorizations and funding. It will include CERP projects and "Foundation Projects," such as Kissimmee River Restoration and Modified Water Deliveries to ENP.

Since Congress approved the CERP, the south Florida restoration program has received valuable feedback from the National Academy of Sciences (NAS) and the GAO. Recommendations made by the NAS in 2006 in its first biennial review of progress toward restoring the Everglades will be incorporated into the IDS and will address expedited implementation of projects that can provide significant, timely and measurable benefits. Also, a report by the GAO recommended a review of the sequencing criteria, modifying the schedule for consistency and applying interim goals as needed for restoration success. These recommendations will also be addressed in the Integrated Delivery Schedule.

The schedule will consider the progress made to date, the federal funding that has been made available and the federal funding required to achieve milestones set when the CERP was approved in 2000.

The Integrated Delivery System is likely to influence future updates of the MISP.

Periodic CERP Updates and CERP Refinements. Section 385.31(c) of the Programmatic Regulations requires periodic evaluations of the CERP using new or updated modeling including the latest scientific, technical, and planning information. An "Initial CERP Update" (ICU) Report was approved by the RECOVER Leadership Group (RLG) in November 2005 and presented to CERP managers at the USACE and the SFWMD. It was determined that additional model and operational refinements should be undertaken to optimize the updated "CERP A" model run performed for the ICU Report. Those refinements (sometimes referred to as "CERP A refinements") are presently underway, but have not yet been finalized.

When completed, the updated model will be utilized to perform an updated evaluation of the CERP (i.e., how well the CERP as modeled with the updated model and planning assumptions would achieve planning goals and objectives). As part of the evaluation, the total quantity of water that is expected to be generated by the plan will be identified, including the quantity expected to be generated for the natural system and the quantity expected to be generated for other water-related needs in the human environment.

CERP, An Annual Update. In 2007, the USACE and the SFWMD completed the first *CERP Report to the Public* for 2006 fulfilling a requirement of the Programmatic Regulations. This document, which will be prepared annually for dissemination to the public, describes the components of the Plan, approved changes to the Plan, the estimated cost of the Plan, a water budget for the Plan, and the water that has been reserved or allocated for the natural system under state law for the Plan. The Report to the Public for 2007 is [currently in progress](#)~~being prepared~~.

CERP Interim Goals and Targets. The Programmatic Regulations require that the Governor of Florida, the Secretary of the Army and the Secretary of the Interior establish interim goals to provide a means for evaluating restoration success of the CERP at specific time intervals during implementation. Additionally, the Governor of Florida and the Secretary of the Army are responsible for establishing interim targets to evaluate progress in providing for other water-related needs of the region.

In 2005, RECOVER developed initial recommendations for the Interim Goals and Interim Targets, which were vetted through independent peer review and then reported to the SFWMD, USACE, and DOI in "*Recommendations for Interim Goals and Targets for the Comprehensive Everglades Restoration Plan.*" The RECOVER recommendations included twenty-two hydrologic, water quality, and biological indicators and five additional indicators for water-related needs (including water supply and flood protection) to support CERP [planning implementation](#) and adaptive management. The Governor of Florida, Secretary of the Army, and the Secretary of the Interior subsequently drafted separate Interim Goal and Interim Target Agreements based on the recommendations from RECOVER.

A draft Interim Targets Agreement was drafted and published in the federal register for public review November 3, 2006 and comments were accepted through December 4, 2006. The final agreement establishing the interim

targets was signed by the USACE and the State of Florida on April 27, 2007. Similarly, the draft Interim Goals Agreement was developed, posted in the Federal Register and available for review until December 4, 2006. The final agreement establishing the Interim Goals was signed and executed by the State of Florida, the USACE, and DOI on May 5, 2007.

Due to changes in CERP planning and implementation, including the construction scheduling and project sequencing, and the recommendation that the interim goals and interim targets include a system-wide viewpoint, RECOVER is currently revising their 2005 recommendations. Revisions will ensure integration of the Interim Goals and Interim Targets with the CERP Monitoring and Assessment Plan (MAP) to ensure the MAP is monitoring the progress of the interim goals and targets. Revisions are expected to be completed in 2009.

CERP Adaptive Management Program

Adaptive Management (AM) has been an integral component of the CERP since the C&SF Restudy was concluded in 1998. Congress recognized there were many uncertainties (unanswered questions) about how to achieve the many challenging CERP ecosystem restoration goals and objectives, and authorized the development of an AM program for the CERP in the WRDA 2000 to ensure these questions were addressed and restoration goals were achieved. Major components of the AM program have been initiated during the eight years since initial authorization of the CERP, the development of conceptual ecological models, system-wide and regional hypotheses, and predictive models, including the Initial CERP Update (ICU), implementation of the system-wide MAP, and development of the Interim Goals and Targets.

The AM program for the CERP was developed by the USACE and the SFWMD, in consultation with the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the USEPA, the DOI, and other federal, state, and local agencies, will assess responses of the South Florida Ecosystem to implementation of the CERP. Periodic CERP updates will ensure that the goals and purposes of the plan are being achieved. A CERP *Adaptive Management Strategy* was submitted by RECOVER to the sponsoring agencies in April 2006. A final draft of the CERP *Adaptive Management Implementation Guidance Manual*, focused on specific guidance to implement an AM approach for the CERP at the program and project levels, is anticipated to be completed in August 2008 to fully integrate AM principles into the CERP.

Independent Scientific Review

On June 14, 2004, the DOI, the USACE, and the SFWMD signed an intergovernmental agreement to engage the NAS review of Everglades restoration. This agreement addresses requirements contained in WRDA 2000 (PL 106-541, Sec. 601(j)) and the Programmatic Regulations (33CFR Part 385.22) for ongoing independent scientific review and a biennial report to Congress and others "that includes an assessment of ecological indicators and other measures of progress in restoring the ecology of the natural system, based on the Plan."

The NAS subsequently convened the National Research Council (NRC) Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP), which is composed of a diverse team of internationally recognized experts in ecosystem restoration science. In their report, *Progress Toward Restoring the Everglades: The First Biennial Review, 2006*, the committee concluded that good science has been developed in support of the restoration efforts and that progress has been made in CERP program support, specifically, significant progress has been made in the implementation of the MAP and development of the CERP AM program (AM Strategy), which represents the pathway by which science is used in support of decision making. The committee expressed concern that progress in CERP project implementation has been uneven, and many projects have been significantly delayed.

The committee also found that the CERP AM strategy provides a sound organizational model for the execution of a passive AM program and encouraged the implementation of the strategy soon in order to test and refine the approach. AM principles have been incorporated into several projects including Ten Mile Creek and the [WCA 3](#) Decompartmentalization and Sheetflow project (DECOMP).

An Incremental Adaptive Restoration (IAR) framework was proposed to help overcome scheduling constraints and facilitate delivery of incremental restoration and learning benefits through implementation of carefully targeted portions of larger projects and greater use of AM principles and processes.

Information on this NAS task and the complete 2006 report is available at:
<http://www8.nationalacademies.org/cp/projectview.aspx?key=WSTB-U-03-04-A> .

The CISRERP team has held five meetings during this reporting period of 2006-2008. Their second report is anticipated in fall 2008.

CERP Monitoring and Assessment Plan

The CERP MAP is the primary tool by which the RECOVER program will assess CERP performance. The MAP, Part 1 (*CERP Monitoring and Supporting Research*, February 2004) describes the system-wide monitoring and research components and supporting research of the MAP and summarizes the assessment process. MAP, Part 2, the *Assessment Strategy for the MAP* (April 2006), fully describes the assessment process for interpreting the monitoring and research data collected by the MAP and ultimately reported biennially in the CERP System Status Report. A further refinement of the MAP is underway with an anticipated completion date in late 2008 or early 2009.

The overarching goal for implementation of the MAP is to have a single, integrated, system-wide monitoring and assessment plan that will be used and supported by all participating agencies and tribal governments as the means of tracking and measuring the performance of the CERP. NAS found this method of tracking the ecosystem response from CERP implementation to be well-designed and statistically defensible.

The four broad objectives for the MAP are:

- Establish a pre-CERP reference state (“baseline”), including variability for each of the performance measures;
- Assess system-wide responses of the ecosystem to CERP implementation;
- Detect unexpected responses of the ecosystem to changes in stressors resulting from CERP activities; and
- Support scientific investigations designed to increase ecosystem understanding, establish cause-and-effect relationships, and interpret unanticipated results.

The first full assessment of MAP data, termed a System Status Report (SSR), was completed in November 2007. The document provides development of a partial pre-CERP reference state using data collected since the MAP’s implementation in 2003. For most indicators, additional data is required to develop a complete “picture” of pre-CERP conditions. The next system status report will be released in 2009.

CERP System Status Report

~~The RECOVER Assessment Team (AT) and the SSR play an important role within CERP.~~ This report is designed to assess and document progress towards meeting performance measure targets and interim and long-term goals. On an annual basis, reports generated by the principal investigators in each of the MAP modules (i.e., Southern Estuaries [SE], Northern Estuaries [NE], Greater Everglades [GE], and Lake Okechobee [LO]) will be compiled by the RECOVER Assessment Team (AT) and used to generate a biennial SSR that will address the overall status of the ecosystem relative to system level hypotheses, performance measures, and restoration goals. Every five years, this SSR will provide the scientific information on the status of the ecosystem’s response to CERP implementation and will be integrated into the Report to Congress planned as of 2010. The SSR provides:

1. A synthesis of findings across MAP modules and across years to provide a holistic description of the status of the Everglades and South Florida Ecosystem;

2. An evaluation of the results in relationship to supporting system-level hypotheses and achieving system-wide Interim Goals;
3. A summary of those changes that are consistent with goals and hypotheses and those that are not;
4. A discussion of why the goals and hypotheses are not being achieved;
5. The identification of major unanticipated findings that may need attention and correction; and
6. Information about issues relevant to the CERP [Adaptive Management \(AM\)](#) Program

The SSR functions as the interface between the science and communication aspect of CERP implementation providing information not only for use in the AM process, but also for reports to the NRC, Interim Goals and Targets Report, and the CERP Report Card, and constitutes a major component of the RECOVER Technical Report mandated by the Programmatic Regulations.

The first SSR (*2006 SSR-Pilot Assessment*, February 2007) provided a proof-of-concept for applying the assessment strategy outlined in the MAP, Part 2 (*Assessment Strategy for the MAP*). However, this pilot assessment was not intended to provide a comprehensive assessment of the ecological condition nor the status of either the MAP modules (NE, SE, GE, or LO) or the South Florida Ecosystem as a whole. The 2007 SSR (*2007 System Status Report*, November 2007) is the first comprehensive technical assessment of monitoring data developed by the Assessment Team. Because few CERP projects have been implemented at this time, the 2007 SSR provides estimates of pre-CERP conditions for ecosystem indicators monitored by the MAP, in conjunction with data from other sources. The role of the MAP and the SSR in the CERP AM program is essential. Results of this and future SSRs as well as monitoring are necessary for assessing positive responses to CERP actions and essential for identifying management actions that may be necessary to adjust the CERP to achieve its goal of restoring the Everglades and the South Florida Ecosystem.

Peer Review

Consistent with the Office of Management and Budget's (OMB's) "*Final Information Quality Bulletin for Peer Review*" (December 15, 2004), the USACE implemented new requirements beginning in 2005 for conducting Independent Technical Review (ITR) and External Peer Review (EPR) to ensure the quality and credibility of USACE decision documents, including CERP PIRs. These new requirements apply to most efforts the USACE may undertake as part of the overall South Florida Ecosystem restoration program, and are contained in the Engineering Circular (EC) 1105-2-408 entitled "*Peer Review of Decision Documents*" (31 May 2005). Review plans address the magnitude and risk of individual projects, detail how ITR will be accomplished, and address the need for additional external EPR by subject matter experts outside of the Corps. Section 2034 ("Independent Peer Review") in WRDA 2007 contains additional peer review requirements for USACE project studies, mandating peer review by a panel of experts for all projects with a total cost more than \$45,000,000. For the reporting period, the following peer reviews were completed:

Limited Re-Evaluation Report

- Modified Water Deliveries to ENP/ Tamiami Trail (January 2008)

CERP PIRs

- Broward County Water Preserve Areas (BCWPA) (March 2007)
- Caloosahatchee River (C-43) West Basin Storage Reservoir (June 2007)
- Melaleuca Eradication and OEP (December 2007)
- Winsberg Farm Wetlands Restoration (February 2008)
- L-31 Seepage Mgmt Pilot (February 2008)

Model Certification

The USACE adopted new requirements to certify planning models utilized in planning studies. These new requirements are contained in Engineering Circular (EC) 1105-2-407 (“Planning Models Improvement Program: Model Certification”), dated 31 May 2005. Planning models are defined by the USACE to be “models and analytical tools that planners use to formulate potential alternatives . . . evaluate potential effects of alternatives and to support decision-making.” This definition has been interpreted to include performance measures developed by RECOVER and other scientists working in the South Florida Ecosystem, and any project-specific evaluation methodologies developed to compare the impacts and benefits of restoration plans included in USACE planning studies, including CERP PIRs, feasibility studies, and other decision documents. Costs for model certification actions are considered a project cost and are cost-shared with non-federal partner agencies.

During this reporting period 2006-2008, USACE Jacksonville District initiated several project model review actions with the U.S. Army Corps of Engineers' Ecosystem Restoration Center of Expertise, including project-specific evaluation methodologies utilized for the Modified Water Deliveries Tamiami Trail Limited Re-evaluation Report, Biscayne Bay Coastal Wetlands PIR, and the Lake Okeechobee Watershed PIR. In addition, a programmatic review of approved RECOVER performance measures and conceptual ecological models was initiated.

Program Management – Information and Data Management

The CERP Master Program Management Plan (MPMP) called for the creation of a shared data network. The MPMP directed implementation of these activities under the guidance of the Program Controls Management Plan. Data Management was separated out in the Data Management Program Management Plan dated February 26, 2002. The scope of this program plan was to provide for a program-wide phased approach to management and acquisition of data. Included in that scope were activities to identify, standardize, organize, document, serve, and preserve program data. The Information & Data Management PMP was rewritten and approved in April 2007, superseding the Data Management PMP dated February 2002 and assuming responsibility for engineering and GIS data management. The document also assumes responsibility for the current management of the functional areas of infrastructure, World Wide Web services, and electronic document management previously described under the Program Controls Program Management Plan dated December 2000. The PMP for Quality Assurance and Oversight, which is responsible for the quality of scientific data collected for the program, was also incorporated into the Information & Data Management PMP. The financial management functional area is not included in the new PMP.

Program Management - Interagency Modeling Center (IMC)

While the authority for the Interagency Modeling Center (IMC) Program Management Plan was not specifically mentioned in WRDA 2000, it is implicit in the Design Agreement between the Department of the Army and SFWMD and in the MPMP that the modeling needs of CERP implementation must be met in a sufficient and adequate manner. A collaborative state and federal interagency effort, the IMC was established in 2003 to provide a centralized pool of resources and expertise to promote greater efficiency and consistency in the hydrologic and ecologic modeling that supports CERP planning. It provides, coordinates, and oversees the modeling needs and efforts for the CERP both at the program coordination level, such as modeling that will be needed for the MISIP updates, and at the project level for individual project analyses. The PMP is currently being revised.

Global Climate Change

The United Nations' Intergovernmental Panel on Climate Change (IPCC) issued their fourth report in 2007, providing new evidence indicating that global warming and related climate change are occurring. But, there continues to be considerable uncertainty about the rate of change, how much it may accelerate in the next 50 to 100 years, and the total magnitude of these changes. Forecasted climate change impacts which are of particular interest to Florida and Everglades restoration efforts include sea level rise, increases in evapo-transpiration rates, changes in hydrologic patterns, increased tropical storm frequency and/or intensity, increased stresses on plants and animals due to increasing temperatures and levels of Carbon Monoxide, and water quality impacts also due to increasing temperatures, as well as salinity changes.

All of these are expected to gradually drive changes in marine and land ecosystems and human activities. Some of these impacts are described in greater detail in the fall 2007 testimony to Congress by the Superintendent of ENP regarding the potential impacts on natural resources in ENP and other nearby areas.

Most of the partner agencies engaged in Everglades restoration have scientific research in progress or planned that can also be used to help better quantify the potential impacts of climate change on the natural and human environments in south Florida. Of particular interest is an accurate understanding of the sensitivity of the ~~CERP~~ and the south Florida area to sea level rise since much of this area is only a few feet above current sea level. During preparation of the CERP April 1999 report, a sensitivity analysis was done for a potential 0.5 foot rise in sea level and it was determined that the CERP could accommodate this potential change without major negative impacts. The CERP Guidance Memorandum 016.01, using more up to date information, recommended using 0.8 foot rise in sea-level for all system-wide planning evaluations. However, recent climate change forecasts indicate a need to look at an even broader range of sea level rise scenarios. This effort will be initiated in FY2009 under the leadership of the CERP RECOVER system-wide planning team through a sea-level rise sensitivity analysis of CERP performance. RECOVER will use the most up to date information from several workshops on Climate Change and its effects that were held nationally by the USACE, FWC, the State of Florida, and during the Greater Everglades Ecosystem Restoration Conference.

Climate change is also a topic of special interest to CISRERP. Their fall 2008 report is expected to include guidance on sea level rise sensitivity and other climate change related studies which are needed to help guide and adapt ongoing Everglades restoration efforts.

GOAL 1 ACCOMPLISHMENTS: GETTING THE WATER RIGHT

The first strategic goal of the Task Force focuses on the lifeblood of the Everglades: water. The Task Force has adopted the following for this goal:

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 1.57 billion gallons per day by 2030
- Objective 1-A.3: Modify 36145 miles of impediments to flow by 2020

Subgoal 1-B: Get the water quality right

- Objective 1-B.1: Construct 91,345 96,101 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 2011

The major projects planned to meet these objectives are listed in the Task Force *Strategy* in part one of this volume (*Coordinating Success*), along with a schedule for their implementation. The projects or activities that were ongoing or completed during the July 2006 – June 2008 reporting period are described below in the context of progress toward meeting each of the Task Force objectives. The Critical Restoration Projects and state expedited projects contribute to various objectives but are grouped together in this *Biennial Report* to provide an overview of the progress associated with these early efforts.

State of Florida's Expedited Restoration Projects

To help achieve ecosystem-wide benefits as soon as possible, Florida is fast-tracking various Everglades water storage, [water](#) quality and [environmental](#) restoration projects. As part of that overall initiative, the SFWMD began in October 2004 an effort to accelerate several Everglades restoration projects identified in the CERP, most of which were initially authorized by Congress. The projects range in construction value from \$14 million to \$720 million. Several of the projects include multiple components or sub-projects for a total of 18 independent projects. In order to achieve earlier restoration benefits and cost efficiencies, it is expected that over \$1.5 billion will be expended in these earlier years in additional state funds above the \$200 million per year already planned for the CERP. The goal of expediting these projects is to complete the design and construction of the identified projects by 2011. It is anticipated that through close coordination with federal agencies the state will design and construct projects that are consistent with all or part(s) of the recommended plan for the corresponding CERP components. It is also anticipated that these projects will be consistent with the CERP recommended plans and proposed to Congress for crediting authorization.

The design phase is complete for 7 of the 18 independent projects of which one project is currently under construction and one has been completed.

The Everglades Agricultural Area (EAA) A-1 Reservoir construction contract was awarded in June 2006 with a five year construction schedule. Construction continues today and is approximately 20 percent complete.

To guide final design, minimize risk, minimize cost, and maximize efficiency for the reservoir and future impoundment projects, three sets of full-scale test cells were constructed and tested; one each at the EAA A-1 Reservoir, C-43 Reservoir, and C-44 Reservoir sites.

Construction of the initial phases of EAA Compartment B STA (STA 2 Cell 4), EAA Compartment C STA (STA 5 Flowway 3 and STA 6 Section 2), and Compartment C USSC C-139 Annex Pump Station is complete. Design of the build-out phases of EAA Compartment B STA and EAA Compartment C STA is nearing completion. Procurement

of pump equipment (engineers-gear boxes-pumps) for the large inflow and outflow pump stations is currently underway.

In May 2007, the USACE requested [SFWMD concurrence for USACE to assume the lead increased participation in CERP by assuming the lead](#) (design and construction) on the [Site 1 Impoundment, Picayune Strand Restoration and Broward County Water Preserve Area projects](#) (~~Site 1 Impoundment, 3A/3B Seepage Management Area, C-11 Impoundment, and C-9 Impoundment~~) ~~and the Picayune Strand Restoration~~ Project. This has transitioned the original accelerated initiative into the wider Everglades restoration program.

CRITICAL RESTORATION PROJECTS

The progress made on the nine Critical Restoration Projects authorized under WRDA 1996 to produce immediate, substantial, and independent benefits prior to the existence of the CERP is summarized below. (SFWMD) WRDA-1996 authorized \$75 million dollars in federal funds to be appropriated with a requirement that federal dollars be equally matched by local sponsors.

The maximum federal expenditure on any one project was capped at \$25 million in WRDA 1996. Due to cost increases resulting from inflation, as well as design refinements made since 1996, the Corps was compelled in 2004 to terminate Federal involvement in several projects to refrain from exceeding the cumulative \$75 million for the critical projects program. Congress subsequently increased the federal allocation cap for the critical project program in WRDA 2007 from \$75 to \$95 million enabling the USACE to proceed with several projects where the per-project cap for Federal spending (\$25 million) had not been yet been met. One project did receive Congressional approval of an increase on the Federal cost share - the Seminole Big Cypress Water Conservation Plan was authorized at \$30 million in Federal funds. Unfortunately, because of significant increases in the cost of fuel and construction materials, the \$95 million will not allow the USACE to participate in all nine of the Critical Restoration Projects.

Seminole Tribe Big Cypress

Construction of the conveyance canal system on the east side of the reservation (Phase I) was completed in May 2004. Canal pump stations will connect this conveyance canal system to the North Feeder Canal system. Phase II of this project has been divided into four basins. The USACE awarded a contract for construction of the largest basin, basin 1, in November 2006. Construction of this feature will be completed in July 2008. The construction feature, basin 4, is scheduled to be awarded in September 2008 with an anticipated completion date of March 2009. The last 2 construction features, basins 2 and 3, are scheduled for construction award in spring of 2009 and completion in spring 2010. This project will enhance the Big Cypress Reservation's water storage capacity, improve wetland hydrology, enhance flood protection, and reduce the concentration of phosphorus from water flowing off reservation lands. Outflows from the project will be routed southward and to the current West Feeder Canal system on the reservation to rehydrate the undeveloped native area and the Big Cypress National Preserve.

Lake Okeechobee Water Retention/Phosphorus Removal

[Construction on the Taylor Creek portion was physically complete effective 4 April 2006. The interim construction and testing phase is in progress from October 2006 through October 2008. Construction on the Nubbin Slough portion was physically complete effective September 2006. The interim construction and testing phase is in progress from September 2007 through September 2009. Construction of the Taylor Creek and Nubbin Slough STAs was completed in 2006.](#) This project reestablished wetlands that were previously drained for agriculture and constructed STAs to reduce phosphorus loading to Lake Okeechobee. It is now in the interim operations phase.

Ten Mile Creek Water Preserve Area

Construction was initially completed on the Ten Mile Creek Water Preserve Area Project in January 2006. Since that time, interim operations, testing and monitoring have been under way by the SFWMD and the USACE in accordance with the water quality permit and Project Cooperation Agreement. In preparation for transfer of the

project to the SFWMD for maintenance and operations, concerns were raised about some aspects of the project. In September 2007, the USACE and the SFWMD immediately began identifying causes for all concerns and developing a course of action for remediating those aspects to complete project delivery. The additional project needs that have been identified have significant associated costs. Due to limitations on funding, additional Congressional authorization will likely be required to proceed.

Lake Trafford Restoration

The Lake Trafford Restoration Project was initiated in 2004. The in-lake portion of dredging was completed in the spring of 2006. This phase of the project removed approximately 3 million cubic yards of organic sediments that blanketed the bottom of the lake. The second phase of the project to remove approximately 800,000 cubic yards of sediment from the littoral zone was commenced in the fall of 2006. However, the prevailing historic drought of south Florida rendered the lake levels critically low for operation of the dredging machinery, and the construction contract had to be terminated. The total construction cost of Phase I was \$10.3 million. The contracted amount for phase II was \$5.1 million. The USACE participated in design of the project and may be able to contribute to the construction costs based on WRDA 2007 authorization, which has increased the Federal funding cap from \$75 million to \$95 million.

The USACE completed plans and specifications, but at that time there was insufficient funding to award a contract. The SFWMD assumed 100% of the cost of revamping the detailed design and the construction with the intent of receiving credit and/or reimbursement upon project completion and approval by the USACE. The containment facility and much of the dredging have been completed. The FWC and Collier County Tourist Development Council provided some financial assistance to SFWMD for the project. Once completed, the project will improve water quality and enhance fish and wildlife habitat in Lake Trafford.

Tamiami Trail Culverts

Construction of the western portion of the project (Phase I), located west of State Road [9229](#), started in June 2004 and was completed in March 2006. Implementation was accomplished with SFWMD (culvert construction) and Florida Department of Transportation (road resurfacing) funds. Construction of the eastern portion of the project (Phase II) is dependent upon additional funding. The project will help restore more natural hydropatterns and improve sheetflow of surface water within the Ten Thousand Islands National Wildlife Refuge, Rookery Bay Estuarine Research Reserve and Aquatic Preserve, Big Cypress National Preserve, and ENP. The cost estimates for completion of this project in combination with the other eight Critical Projects previously exceeded the USACE appropriation cap of \$75million set by WRDA 1996. Phase I of the project has now been included as a component of the Picayune Strand Restoration Project, authorized for construction by Congress as part of WRDA 2007, which will make Phase I of the culvert project eligible for federal cost-share. USACE may be able to contribute to the construction costs based on the recent WRDA 2007 authorization, which increased the Federal funding cap up to \$95 million.

Southern CREW Addition/Imperial River Flowway

This project will restore historical sheetflow in the project area, reduce excessive freshwater discharges to Estero Bay during the rainy season, improve habitat for listed species and other wildlife, reduce loading of nutrients and pollutants to the Imperial River and Estero Bay, and reduce flooding of homes and private lands west of the project area. It includes the removal of canal and road berms, house pads, and ditches to allow historic sheetflow to be re-established in the Southern Corkscrew Regional Ecosystem Watershed (CREW). Land acquisition, restoration construction, and exotics control for the project is ongoing. Land acquisition has been accomplished with state and federal cost sharing. Several hundred acres of exotic species, primarily melaleuca, have been treated. In addition, a number of canals have been plugged and berms breached to restore sheet flow in areas of the project footprint.

Because of escalating land costs in the region, particularly in proximity to Bonita Beach Road, and the difficulty in restoring the hydrology in the areas south of Kehl Canal, the project team is considering changes in the project footprint. Continuing development within the Imperial River basin, the hydrologic impact of the Kehl Canal on the South half of Sections 32, 33, and 34, and escalating land costs in the region have forced the need for reformulation.

The SFWMD is proposing to reduce the footprint; by excluding the southern half of sections 32 and 33, south of the Kehl Canal, and also those areas impacted by the proposed alignment of County Road 951. Even with the change in footprint due to removal of these lands, the SFWMD will be able to maintain a flow way and corridor along the Kehl Canal and Imperial River connecting and restoring lands within Southern CREW and CREW Trust lands. Approximately 45 acres in the northwestern corner of Section 32 and 15 acres in the southwestern corner of Section 34 would also be removed from the project.

The District may be able to partner with Lee County Conservation 20/20 to advance acquisition of remaining project lands. Lee County Conservation 20/20 is considering the acquisition of lands already purchased by the SFWMD south of the Kehl Canal in Section 34. These lands would be preserved and the funds paid to the SFWMD could be used to acquire other lands within the project footprint. The SFWMD continues to acquire land and construct the project.

~~near the proposed County Road 951 extension, due to encroachment of development, hydrologic disconnection of the lands and funding constraints. The SFWMD proposes removing hydrologically disconnected portions of Sections 32, 33, and 34 south of the Kehl Canal. With proposed alignment of County Road 951, 55 acres in the northwestern corner of Section 32 would also be removed from the project. However, the removal of lands south of the Kehl Canal and CR 951 allows the SFWMD to maintain a flow way and corridor along the Kehl Canal and Imperial River connecting other public lands to Southern CREW and CREW Trust Lands. A proposal to exchange hydrologically impacted lands south of the canal, the project will be able to obtain the acreage remaining within the revised project footprint (in fee simple and flowage easements) adjacent to the Imperial River flowway. The SFWMD continues to acquire land and construct the project.~~

Subgoal 1-A: Get the hydrology right

Objective 1-A.1: Provide 1.8 million acre-feet of surface water storage by 2036

At the end of the reporting period, six of the projects contributing to objective 1-A.1 were underway, along with a technology pilot to determine the feasibility of the two Lake Belt storage projects.

Biennial Report Table 1 – Surface Water Storage

1-A1 Table reflects June 2008 Status of the Projects to Provide 1.8 million Acre-Feet of Surface Water Storage by 2036				
Project ID	Project Endpoint	Project Name	Output (acre-feet)*	Status
1101	2019	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) (CERP Project WBS #07)	135,000	In Progress
1102	2015	C&SF: CERP Everglades Agricultural Storage (CERP Project WBS# 08)	360,000	In Progress (Planning); Complete (Acceler8 Design)
1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS # 01)	272,823	In Progress
1105	2036	C&SF: CERP North Lake Belt Storage Area (CERP Project WBS # 25)	90,000	
1106	2017	C&SF: CERP PBC Agriculture Reserve Reservoir - Part 1 (CERP Project WBS #20)	20,000	
1107	2013	C&SF: CERP Site 1 Impoundment (CERP Project WBS# 40)	13,280	In Progress
1109	2013	C&SF: CERP C-43 Basin Storage Reservoir --Part 1 (Caloosahatchee River (C-43) West Basin Storage Reservoir and Caloosahatchee Watershed) (CERP Project WBS # 04)	170,000	In Progress
1110	2036	C&SF: CERP Central Lake Belt Storage Area (CERP Project WBS #26)	190,000	
1111	TBD	E &SF: Critical Projects – Ten Mile Creek	6,000	

1112	2015	Taylor Creek Reservoir - Expedited Project - The SFWMD is implementing as part of Northern Everglades Project	32,000	
1113	2014	C&SF: CERP WPA Conveyance (CERP Project WBS# 49)	90,000	
1114	2017	C&SF: CERP Everglades National Park Seepage Management (CERP Project WBS# 27 and 43)	11,500	In Progress
1115	2015	C&SF: CERP North Palm Beach County - Part 1 (CERP Project WBS #17) (Formerly Project ID 1503)	48,000	In Progress
1116	2017	C&SF: CERP Broward County WPAs (C-9 Stormwater Treatment Area/Impoundment and Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management) (Formerly Project ID 1501)	11,648	In Progress
2100	TBD	Allapattah Flats/Ranch	32,000	In Progress
* The outputs listed in Biennial Report Table 1 and the measures and restoration endpoints in Appendix A (the Integrated Financial Plan Summary Table) reflect the strategic goals and are not intended to function as an allocation or reservation of water, which must be implemented through applicable law.				

Everglades Agricultural Area Storage Reservoir

The preliminary survey and geotechnical work on the state expedited reservoir feature was completed in May 2004. Preparation of the thirty percent design commenced in June 2004. In late April 2004, the U.S. Sugar Corporation agreed to vacate leased, state-owned land (former Talisman Sugar Company property) just south of Lake Okeechobee, allowing the SFWMD to expedite work on this large reservoir and stormwater treatment area. The Tentatively Selected Plan (TSP) was identified in February 2006. In November 2006, CISRERP recommended IAR principles for implementation on five CERP projects, including this one.

There will be two separate PIRs for two phases of the EAA project. In December 2006, program managers recommended that the Phase 1 PIR should be modified to focus on implementation of Cell 1. Upon completion of a Final PIR for Phase 1, a second PIR will be prepared to address remaining storage (160,000 acre-feet) and water quality treatment needs for Phase 2 of the EAA reservoir to achieve system-wide goals and objectives. The SFWMD is advancing the design and construction of Phase 1 as a state-expedited project. The overall construction contract was awarded in June 2006 and a start on site in August 2006. Three Guaranteed Maximum price construction phases have been executed valued at \$265 million with two completed to provide a 12 mile seepage canal. The third phase involves ongoing rock crushing operations to provide material for the embankment, with the construction due to start summer 2008. Phase 2 would be constructed by the USACE.

Lake Okeechobee Watershed (LOW)

This project goal is to increase aquatic and wildlife habitat, regulate extreme highs and lows in Lake staging, reduce phosphorus loading, and reduce damaging releases to the surrounding estuaries. It will also focus on rehydrating wetlands in and around the areas north of Lake Okeechobee and improve the ecological health of Lake Istokpoga. The final LOW Project TSP consists of the following six structural water storage and treatment features and a recommended Lake Istokpoga Regulation Schedule (LIRS):

- Reservoir in the Taylor Creek/Nubbin Slough basin - A 1,984 acre reservoir, located in the S-191 sub-basin, will provide a maximum capacity of 32,000 acre-feet situated on the Grassy Island Ranch and will receive inflows from and discharge back to Taylor Creek.
- STA in the Taylor Creek/Nubbin Slough basin - A 3,975 acre treatment area, be located in the S-135 sub-basin, will receive inflow from the L-64 canal, discharge back to the L-47 canal, and is projected to provide 15.8 metric tons of average annual phosphorus load reduction.
- Reservoir in the Kissimmee River basin - A 10,281 acre above ground reservoir will provide a maximum storage capacity of 161,263 acre-feet located in the C-41A sub-basin will receive flow from and discharge back to the C-38 canal (Kissimmee River).
- Reservoir in the Lake Istokpoga basin - A 5,416 acre reservoir is proposed to be located in the C-40A and C-41A sub-basins and provide a maximum storage capacity of 79,560 acre-feet and will receive inflow from and discharge back to the C-41A canal.

- STA in the Lake Istokpoga basin - An 8,044 acre treatment area will be located in the L-49 sub-basin (at an average operating depth of 1.5 feet). It will receive flow from the C-41 canal and discharge treated water to Lake Okeechobee and is expected to provide approximately 29.1 metric tons of average annual phosphorus load reduction.
- Restoring a wetland in Paradise Run - A 3,730 acre wetland restoration site is located at the ecologically significant confluence (under pre-development conditions) of Paradise Run, oxbows of the Kissimmee River, and Lake Okeechobee. Under restored conditions, it would have a rain-driven hydrology unless future efforts to further enhance watershed conditions could link the site to the surface flows from the C-38 (Kissimmee River) or C-41A (Istokpoga) Canals.

Caloosahatchee (C-43) Basin Storage Reservoir

The Caloosahatchee (C-43) Basin Storage Reservoir and ASR project (originally component D in the CERP) was divided into two parts: an ASR and an examination of other problems and opportunities. The latter has been further subdivided into two separate PIRs now referred to as: (a) the Caloosahatchee River (C-43) West Basin Storage Reservoir (WBSR) project and (b) the Caloosahatchee Watershed project.

The purpose of the WBSR is to restore the Caloosahatchee estuarine and riverine ecosystems by improving hydrologic conditions. To achieve this goal, the WBSR team identified two key objectives: (1) provide additional water to the estuary to augment low or no flows over S-79 during the dry season/dry periods, and (2) reduce damaging peak flows to the estuary by capturing and storing excess basin run-off and Lake Okeechobee releases during high flow conditions. Based on the current conditions, the project still achieves the benefits in a cost-effective manner. The Final PIR was completed in September 2007 and is anticipated to be submitted to Congress in 2008.

As a state-expedited project, The the SFWMD initiated the 30 percent design of the reservoir at Berry Groves during the prior reporting period. Final design of the reservoir was completed in January 2008. The C-43 West Reservoir CERP Regulation Act (CERPRA) permit, U.S. Coast guard permit for Manatee Barrier Lights A and B, the Florida Department of Transportation driveway connection permit, Hendry County permit for the C-43 West Reservoir Project citrus tree removal and grubbing, USACE 404 Permit, and DEP 1502 Permit for construction have been received. Construction of this project is on hold until further notice. The construction permit has been issued and the operations permit is in process. (SFWMD) Subsequent technical uncertainties with associated potentially high rates of seepage are currently being investigated with the construction of two test cells on-site employing a variety of seepage barrier technologies. The results of this pilot project, along with the ASR Regional Study, will form the basis for future feasibility studies or PIRs concerning high-capacity ASR.

~~The purpose of the WBSR is to restore the Caloosahatchee estuarine and riverine ecosystems by improving hydrologic conditions. To achieve this goal, the WBSR team identified two key objectives: (1) provide additional water to the estuary to augment low or no flows over S 79 during the dry season/dry periods, and (2) reduce damaging peak flows to the estuary by capturing and storing excess basin run-off and Lake Okeechobee releases during high flow conditions. Based on the current conditions, the project still achieves the benefits in a cost-effective manner. The Final PIR was completed in September 2007 and is anticipated to be submitted to Congress in 2008. As a state-expedited project, the SFWMD designed a reservoir at the Berry Groves site, and final plans and specifications were completed in 2008. The construction permit has been issued and the operations permit is in process. However, construction of this project is on hold until further notice.~~

The Caloosahatchee (C-43) Watershed Project will address water quality, water management, and ecological restoration challenges, while also ensuring that agricultural water supply requirements and flood attenuation are not negatively impacted. The goals are to identify, evaluate, and implement methods and/or means to: (1) enhance water quality in the basin, (2) further decrease dependency upon water releases from Lake Okeechobee without disrupting water supply needs in the basin, and (3) promote ecosystem restoration by removing exotic flora and redirecting water flows at specific locations in the basin. A PDT is being assembled and work on a PMP is commencing.

Indian River Lagoon - South

The *Indian River Lagoon Feasibility Study* was completed in October 2002 and the final PIR for the Indian River Lagoon (IRL-S) Project was published in the *Federal Register* on May 7, 2004. The Chief’s Report was approved August 6, 2004 and the Record of Decision (ROD) was signed November 2005. The project will restore approximately 90,000 acres of wetland/upland mosaic and improve approximately 4,000 acres of benthic, oyster and submerged aquatic vegetation habitat within the St. Lucie River and Southern IRL. IRL-S has recently been authorized for construction in WRDA 2007. The design for the C23/24 STA component is at the intermediate level and is scheduled to be completed in July of 2008. The SFWMD is advancing the design and construction of the C-44 Storage Reservoir component. The design was functionally complete April 2008. The project is currently awaiting appropriations for construction.

North Palm Beach County – Part 1

The PIR will evaluate whether the L-8 Reservoir is a necessary part of the North Palm Beach County – Part 1 project to capture, store, and treat excess water discharged to the Lake Worth Lagoon and to use these waters for environmental enhancement of the Loxahatchee River and Slough and provide for water supplies to the West Palm Beach Water Catchment Area. Early information suggests its inclusion may be beneficial. Initially constructed elements of Flow Way 1 (G-160, G-161, M-canal widening) and alternatives associated with other flow ways and components providing beneficial flows to the Loxahatchee River, achieving hydropattern restoration, and reducing flows to the Lake Worth Lagoon are being examined. Excess canal water will be backpumped through existing and proposed water control structures and canals to the stormwater treatment areas, which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

The C-51 and L-8 Basin Reservoir Phase 1 (Palm Beach Aggregates) portion of the projects is being designed and constructed through a state-expedited initiative. The construction of the reservoir storage and associated temporary inflow and pumping infrastructure is scheduled to be complete in 2008, resulting in time savings of approximately six years over the conceptual schedule outlined in CERP. Criteria for the final pump station and inflow facility design will be determined through the alternatives analysis and development of the TSP. By utilizing a phased approach to the construction, 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. The full capacity of the reservoir will become available with the construction of the final pump station and inflow structure.

The Loxahatchee Impoundment Landscape Assessment

The FWS has a cooperative agreement with the SFWMD to conduct long-term research on two impoundments in the Arthur R. Marshall Loxahatchee National Wildlife Refuge (NWR). This research is needed to inform the development of several CERP performance measures of a healthy South Florida Ecosystem. The Loxahatchee Impoundment Landscape Assessment (LILA) facility was constructed to include the key Everglades landscape features: tree islands, saw grass ridges, and open-water sloughs. Since June 1, 2004, LILA has served as a research facility used to explore the response of those landscapes as well as wading birds to differing hydrologic regimes. The Biennial Report Table 2 outlines the projects and investigators that have conducted research in LILA during the time covered in this report.

Biennial Report Table 2 – Research conducted at LILA

(June 2006 to June 2008)

Title of Research Project	Tree Island Seedling Analysis	The Response of Tree Seedlings to Transplanting Trees on Tree Islands as a Function of Hydrology (SFWMD)	Prey Vulnerability to Avian Predation	Measurement of Flock Transport in the Everglades
Organization Affiliation of Researchers	Iowa State University	South Florida Water Management District/Florida International University, Miami (SFWMD)	Florida Atlantic University	South Florida Water Management District

Northern Everglades and Estuaries Protection Program

The Northern Everglades and Estuaries Protection Program is developing protection plans for the Lake Okeechobee, St. Lucie, and Caloosahatchee watersheds. One element of the protection plans is to identify the storage needs of each watershed and projects that can help achieve the identified storage goal. The planning process for the Lake Okeechobee watershed has determined that between 900,000 and 1.3 million acre-feet of water storage north of the lake is needed and could be achieved through a combination of above-ground reservoirs, underground storage, and alternative water storage projects on public and private lands. The water quantity storage goal of 900,000 and 1.3 million acre-feet is not in addition to existing or planned projects. It is an overall goal that may be met through a combination of existing or future projects and through a combination of storage methods such as alternative water storage on public and private lands, large above-ground reservoirs, or aquifer storage and recovery facilities. Information from the Lake Okeechobee aquifer storage and recovery pilot projects and other regional pilot projects will help determine the best mix of surface and underground storage needed to achieve the overall goal. Similarly the Caloosahatchee and St. Lucie Rivers Watershed Protection Plans will identify storage goals and projects for these watersheds by January 1, 2009.

Objective 1-A.2: Develop alternative water storage systems capable of storing 1.5-7 billion gallons per day by 2030

At the end of the reporting period, two of the projects were underway and two are scheduled in later bands.

Biennial Report Table 3 - ASR Water Storage

1A-2 Table reflects June 2008 Status of the Projects to Develop Alternative Water Storage Systems Capable of Storing 1.5-7 Billion Gallons per Day by 2030				
Project ID	Project Endpoint	Project Name	Output (Billion gpd)*	Status
1200	2019	C&SF: CERP North Palm Beach County - Part 2 (CERP Project WBS# 18)	.220	
1201	2027	C&SF: CERP Lake Okeechobee ASR (CERP Project WBS# 03)	1	In Progress Installation and testing
1202	2024	C&SF: Hillsboro ASR Phase 2 (M P2) (CERP Project WBS# 22)	0.150	
1203	2017	C&SF: CERP ASR Regional Study		
1204	2020	C&SF: CERP PBC Agriculture Reserve Aquifer Storage & Recovery -- Part 2 (CERP Project WBS# 21) (Formerly part of Project ID 1106)	0.075	
1205	2019	C&SF: CERP C-43 Aquifer Storage and Recovery (ASR)- Part 2 (CERP Project WBS# 05) (Formerly part of Project ID 1109)	0.220	In Progress (Design) and Pilot in Installation and Testing
*The outputs listed in Biennial Report Table 3 and the measures and restoration endpoints in Appendix A (the Integrated Financial Plan Summary Table) reflect the strategic goals and are not intended to function as an allocation or reservation of water, which must be implemented through applicable law.				

Aquifer Storage and Recovery Projects

Aquifer storage and recovery is defined as the storage of water in an aquifer via the use of a dual-purpose well that can be used for both recharge and recovery. ASR technology offers significant potential to store and supply vast quantities of water without the need for large tracts of land.

The ASR program is a vital component to the overall CERP program implemented by the SFWMD and the USACE. Although ASR has been used for many years, there are technical uncertainties of using this technology on such an unprecedented regional scale. These uncertainties are being thoroughly researched through the ASR Regional Study and the ASR pilot projects. In addition, a phased ASR Contingency Study is being prepared to identify storage and water supply options should implementation of ASR at the scale envisioned in the CERP not be possible. The ASR program is the effort of a multiagency, multidisciplinary team of hydro-geologists, chemists, engineers, and environmental scientists who have developed plans, responded to reviews and critiques, formulated strategies, and conducted experiments to answer technical questions about the role of ASR in the CERP.

ASR pilot project systems along the Kissimmee River and the Hillsboro Canal have been constructed and are about to initiate cycle testing. Cycle testing of these systems will take place through 2010, unless they are delayed by water use limitations associated with the ~~current~~ drought. These tests will provide field data to augment scientific and engineering studies that have already been conducted. An exploratory well at Berry Groves, along the Caloosahatchee River, indicated that a high-capacity ASR will not be feasible at that location and was capped and sealed in early 2008. New locations will be assessed in conjunction with the C-43 Watershed PIR. Budget constraints delayed construction of pilot systems at Port Mayaca and Moore Haven. Construction of the Port Mayaca ASR pilot site has been postponed until 2010 to incorporate lessons learned from construction and operation of the Kissimmee River and Hillsboro pilots. Design and construction of a pilot facility at Moore Haven depends on additional funding authority.

A significant database has been compiled and developed into a comprehensive hydrogeologic framework of the Floridan aquifer system in south Florida. Extensive geological and geophysical investigations were then performed to fill in the identified data gaps, including the construction of seven new test wells and core borings throughout south Florida. Additional water-level and water-quality monitoring wells are being established to create a baseline of conditions within the Floridan aquifer system. Geophysical investigations – including a lineament survey, a seismic survey of Lake Okeechobee, cross-well tomography, and a fracture evaluation – were performed to supplement the new geological data.

Large scale groundwater models are being developed that will be used to predict the subsurface effects of the proposed CERP ASR [Programs initiatives](#) throughout south Florida. The models represent the latest in cutting-edge computer programming and can simulate the effects of density, pressure, flow, and transport on both local and regional scales. Results of the pilot projects and the various geological and geophysical investigations will continue to refine and calibrate the models over the next few years.

A variety of geochemical studies and techniques have been developed in coordination with the Florida Geological Survey, the USGS, and others to assess the potential effects of ASR on the quality of water recovered from the Floridan aquifer system. Team members now have a more thorough understanding of the complex geochemical and biological reactions that take place within the Floridan aquifer system as a result of recharge, storage, and recovery of treated water.

An ecological risk assessment will be developed from water quality information that is obtained during cycle testing of the pilot systems. It is anticipated that those results will be available in 2011. An interim report for the ASR Regional Study– summarizing all of the work products that have been completed to date– was published in June 2008. A key expectation of the Lake Okeechobee Watershed Construction Project Phase II Technical Report is completing cycle testing of CERP ASR pilot projects, the interim reports, optimization analysis, and Floridan Aquifer groundwater model.

In addition, a baseline environmental monitoring program and preliminary ecological tests have been performed to assess and predict the effects of the ASR Program on the South Florida Ecosystem. Ecotoxicological, bio-concentration, and methyl mercury evaluations are complete and will be integrated into a conceptual ecological model with data obtained during pilot project cycle testing over the next few years. The conceptual ecological model will provide insight into the relationships between potential stressors and receptors on the environment resulting from ASR systems. This will be an important step toward performing an ecological risk assessment to reveal the potential environmental benefits and risks that might occur from the proposed CERP ASR [Program projects](#).

Additional investigations and studies are planned to provide restoration managers with necessary scientific and engineering information for making technically sound decisions for CERP ASR implementation and operation. This information will be incorporated into the final ASR Program Technical Data Report, which is expected to be available by 2012. The draft report for Phase I of the ASR Contingency Study, which recommends future efforts toward developing a contingency plan, is scheduled to be completed in 2008 and finalized through review and coordination by interagency stakeholders and the public.

State ASR and Deep-Well Injection Projects

The following ASR projects are currently underway: Taylor Creek ASR Reactivation, Seminole Brighton ASR well, and Paradise Run ASR. A Feasibility Study for deep well injection was completed in late 2007.

Lake Okeechobee and Estuary Recovery Plan ASR Projects

Four deep well projects were undertaken as a result of this initiative. A Feasibility Study for deep well injection was completed in late 2007. Re-activation of the Taylor Creek ASR well began in 2006. Permitting and design studies are currently underway. It is anticipated that the facility will be operational in early 2009. A siting evaluation was completed and an exploratory well was constructed at the Seminole Tribe Brighton Reservation ASR well. Permitting and design studies are currently underway. A 10 well ASR system was begun in mid 2006. An exploratory well was constructed in 2007 and permitting and design studies for an initial two well system are currently underway.

Objective 1-A.3: Modify 345-361 miles of impediments to flow by 2020

At the end of the reporting period, one of the projects contributing to objective 1-A.3 was completed and the rest were underway.

Biennial Report Table 4 - Impediments to Flow

1-A.3 Table reflects June 2008 Status of the Projects to Modify <u>345-361</u> Miles of Impediments to Flow by 2020				
Project ID	Project Endpoint	Project Name	Output (miles modified)	Status
1300	2014	C&SF: C-111 (South Dade)	4.75	In Progress
1301	2019	C&SF: CERP WCA -3 Decompartmentalization and Sheetflow Enhancement (CERP Project WBS #12, 13 and 47)	240.00	In Progress
1302	2018	C&SF: CERP Florida Keys Tidal Restoration (CERP Project WBS# 31)	0.60	
1303	2015	E&SF: Critical Projects - Southern CREW		
1306	2013	Kissimmee River Restoration	31.00	In Progress
1307	2013	Modified Water Deliveries to Everglades National Park	21.00	In Progress
1308	2011	E&SF: Critical Projects Tamiami Trail Culverts (Formerly Project ID 1400)	16	In Progress
Completed Projects				
1304	2012	East WCA-3A Hydropattern Restoration	8.50	Completed
1305	1997	Kissimmee Prairie	39.30	Completed

Foundation Projects

Kissimmee River Restoration

All 102,061 acres of land needed for the restoration have been acquired. Natural flow has been reestablished for an 18 mile section of the Kissimmee River, including 4 miles reconnected during the past period and the 14 miles that were reconnected in 2001. These first two (of four) restoration phases required backfilling a total of 10 miles of canal C-38 and have resulted in about 6,300 acres of formerly drained portions of the river’s floodplain now experiencing enhanced inundation and converting back to wetland habitat.

This restoration project, which is being jointly implemented and cost-shared by the SFWMD and the USACE, has two remaining construction phases. When complete, the project will have backfilled a total of 22 miles of C-38 and eliminated two major water control structures. Flow will be reestablished to approximately 40 miles of meandering

river channel and over 12,000 acres of wetlands will be restored within a river/floodplain ecosystem over 40 square miles in area.

A comprehensive evaluation program for tracking environmental responses to the restoration is in place to gauge the success of the project in meeting its goal of ecological integrity for the river and the floodplain. The evaluation program predicts and tracks ecological changes that are expected to result from the project, including changes in hydrology, water quality, and major biological communities such as plants, invertebrates, fish, and birds. Restoration evaluation research is required to be continued by the SFWMD for at least five years following completion of the final phase of construction (currently projected for 2013), or until environmental responses stabilize.

The SFWMD is also conducting the Kissimmee Basin Modeling and Operations Study (KB MOS) to evaluate alternative water regulation schedules for the Upper Kissimmee Basin. This project will help meet the water needs of the Kissimmee River Restoration Project in the Lower Kissimmee Basin while maintaining flood protection. KB MOS continues to involve the SFWMD, the USACE, and many other participating local, state, and federal entities, as well as the public.

Modified Water Deliveries to Everglades National Park

Modified Water Deliveries, commonly called Mod Waters, was initially authorized by the ENP Protection and Expansion Act in 1989 to modify the C&SF project and “to the extent practicable, take steps to restore the natural hydrological conditions within the Park.” The improvement in water deliveries to the expanded ENP was also intended to benefit the Everglades wetlands in WCA 3A and WCA 3B. Due to concerns over delays and the development of the larger CERP in WRDA 2000, Congress made the appropriation of funds for construction of components of the CERP WCA-3 Decompartmentalization and Sheetflow Enhancement Project and the Central Lakebelt Storage Project contingent on the completion of the MWD.

There are four main components of the MWD project: (1) flood mitigation for the 8.5 Square Mile Area (SMA) which is a residential and agricultural area directly adjacent to ENP; (2) conveyance and seepage features to facilitate flow through the system from WCA-3A to WCA-3B and limit seepage eastward from WCA-3B and ENP; (3) modifications to the Tamiami Trail to facilitate water flow under the road; and (4) Project Implementation Support, which includes monitoring and operational changes. All four components are necessary and work together to restore flows from WCA-3A to WCA-3B under Tamiami Trail to the historic headwaters of the NESRS in the Everglades Expansion Area.

The flood mitigation for the 8.5 Square Mile Area is nearly complete:

- Acquisition of the western 2,100 acres and lands for construction of the 8.5 SMA (98% complete)
- Construction of an interior canal and western levees to provide the needed mitigation for the remainder of the 8.5 SMA (complete)
- Construction of the S-357 pump station on the south side of the 8.5 SMA with an associated Stormwater Treatment Area within the C-111 ([South Dade](#)) Project (complete)

The 1992 GDM specified the construction of the conveyance and seepage control features – gated structures, spillways, and pump stations. Several features are now complete as noted below:

- Structures S-345A, B, and C through the L-67A and C levees (pending)
- Structures S-349A, B, and C in the L-67A Borrow Canal (pending)
- Osceola Camp elevation design and construction (pending)
- L-29 weirs (pending)
- Degradation of the L-67 Extension Canal and Levee (4 of 9 miles degraded)
- S-331 Command and Control (in progress – Adding telemetry and remote control of conveyance features)
- Spillway structures S-355A and B in the L-29 Levee (complete)
- S-333 modifications (complete)
- Tigertail Camp elevation (complete - area raised to 12.00 feet with first floor elevations of at least 12.5 feet)

- Pump Station S-356 between L-31N Canal and L-29 Canal (complete)

The USACE will address any remaining design modifications to existing C&SF project features for this component in an Engineering Documentation Report, with supporting National Environmental Policy Act (NEPA) documentation in Fiscal Year 2009.

The revised *Final General Reevaluation Report and Supplemental Environmental Impact Statement* for the Tamiami Trail modifications component of the MWD Project was completed in November 2005. The Record of Decision was signed in January 2006 and a real estate supplement was prepared in March 2006. The selected plan (Alternative 14) included constructing approximately three miles of bridges and raising the remaining road to allow conveyance of higher water stages expected to occur under the CSOP for the MWD ENP and C-111 projects. The USACE initiated design of the bridges and road raising; and has completed the initial geotechnical investigation and boundary surveys. However, estimated costs for the Tamiami Trail feature have grown dramatically since the 2005 Record of Decision. In response to cost increases in fuel, steel, Portland cement, and asphalt, the USACE initiated an integrated Limited Reevaluation Report (LRR) and Environmental Assessment (EA). A draft LRR was released for public comment in April 2008. It included a tentatively selected plan which included a one-mile eastern bridge, allowing L-29 Canal stage to reach 8.5 feet National Geodetic Vertical Datum (NGVD), and reinforcing the road to mitigate for road impacts from the 8.5 foot stage. The Final Integrated LRR and EA are scheduled to be submitted to Congress by July 2008.

The project implementation support component includes project and program management support by the DOI and USACE, hydrological stream gage monitoring and wildlife monitoring, and operational plan development and close-out.

C-111 (South Dade)

The land exchange for this project of approximately 1,000 acres between ENP and the SFWMD was approved by Congress and executed in 2005. The USACE is preparing a Post Authorization Change Report to detail the design refinements and update the project costs and schedule necessary to complete the approved plan. Construction contracts were initiated in 2008 to complete earthwork for the detention flow way linking the B and C pump station detention areas. This extension expands the effective area being used to build a hydrologic barrier between ENP and the L-31N canal in order to reduce seepage losses from ENP. A construction contract will be initiated in 2010 to extend the S-332B north detention area and contain discharges of the 8.5 Square Mile Area STA component of the MWD ENP. This C-111 Project will help restore flows to Taylor Slough, reduce damaging discharges to Florida Bay, and maintain flood control.

The PMP, [which](#) was revised and updated in October 2007, ~~and~~ is now being updated again. The project currently has two construction projects in process, the S-331 command and control facility and the retention/detention area (expansion at the southern detention area). Construction on the S-331 command and control facility is scheduled to be complete in March 2009. Construction of the retention/detention area is scheduled to be complete by September 2008. The project team is in the process of gaining approval of project feature refinements from USACE headquarters. A revised decision document and a Project Cooperation Agreement (PCA) to address the 50/50 cost share are forthcoming to address the design refinements.

Modifications to the C-111 project should be complete by 2014, subject to appropriations. A Combined Structural and Operational Plan (CSOP) for the Mod Waters Deliveries Project and the C-111 Project is currently being developed ensuring that both are operated consistently with project purposes and achieve the intended benefits while protecting the quality of water entering ENP. The L-31W tie back and the S-332D tie back are linked to the 8.5 Square Mile Area project.

Water Conservation Area 3 Decompartamentalization and Sheetflow Enhancement

The WCA 3 Decompartamentalization (Decomp) and Sheetflow Enhancement project outlined in the C&SF Restudy included the following components:

- AA: Construction of additional S-345 conveyance structures (through L-67 canals A and C).
- QQ Phase 1: Raise and bridge (using ten 100-foot box culvert bridges) the eastern portion of Tamiami Trail and completely backfill the Miami Canal within WCA-3.
- SS: North New River Improvements needed to improve the discharge capability of an expanded/improved North New River Canal, necessary to compensate for the capacity lost via removal of the Miami Canal.
- QQ Phase 2: Remove the remaining sheetflow obstructions, i.e., L-67A borrow canal (by filling in the southern 7.5 miles), L 68A, L-67C, L-29, L-28 tieback levees, and borrow canals.

Components QQ and SS were two of the ten “Initially Authorized Projects” identified in WRDA 2000.

Because of scientific uncertainties and dependence on the MWD Project, the Decomp PDT is moving forward with a multiple PIR approach that implements decompartmentalization using adaptive management, construction of a first phase, monitoring of component performance, and additional construction for decompartmentalization to achieve desired results.

PIR 1 will cover a portion of the Restudy Part 1--the Miami Canal and North New River features. PIR 2 will focus on the remainder of the April 1999 Restudy Part 1 features (Tamiami Trail, degradation of L-29, backfilling the L-29 Borrow Canal, and additional S-345 conveyance structures through L-67 canals A and C). PIR 3 will incorporate the remaining Decomp features outlined in Decomp Part 2. Sequencing of Decomp with MWD, C-111 (South Dade), and CERP projects (e.g., L-31N Seepage Management Pilot, ENP Seepage Management, Broward County Water Preserve Areas, and Everglades Agricultural Area Reservoir) are critical because the projects for this region are so interrelated.

Other Related Hydrology Projects

Seepage Management Pilot

The purpose of this project is to resolve the critical uncertainties surrounding seepage management technologies which could be considered to control seepage from the ENP and WCA 3B. In early 2005, after further study of the L-31 North site, it was determined that a seepage management feature located along L-31 North levee and canal would reduce some seepage, but due to anticipated needs associated with the MWD project, it would be less useful for long term effects. Therefore, the project team was asked to review seepage management along the L-30 levee and canal. The team completed a draft Pilot Project Design Report in April 2008 recommending construction of a roughly 1,000 foot linear barrier of sheet pile and soil cement bentonite mixture for testing of constructability and effectiveness. A detailed monitoring plan has been developed for the measurement of the seepage reduction achieved by the constructed barrier.

Subgoal 1-B: Get the water quality right

Objective 1-B.1: Construct 91,345,96,010 acres of stormwater treatment areas by 2035

At the end of the reporting period, five of the projects contributing to objective 1-B.1 were completed, and ten were underway.

Biennial Report Table 5 – Acres of Stormwater Treatment Areas

1-B.1 Table reflects June 2008 Status of the Projects to Construct 96,010 Acres of Stormwater Treatment Areas by 2035				
Project ID	Project Endpoint	Project Name	Output (acres)	Status
1500	2019	C&SF: CERP Big Cypress/L-28 Interceptor Modifications (CERP Project WBS# 10)	1,900	
1502	2016	C&SF: CERP Miccosukee Tribe Water Management Plan (CERP Project WBS# 90)	900	In Progress
1505	2018	C&SF: CERP Caloosahatchee Backpumping with Stormwater Treatment (CERP Project WBS# 06)	5,000	
1506	2009	E& SF: Critical Projects Lake Okeechobee Water Retention/Phosphorus Removal	940	In Progress
1513	2008	C&SF: West Palm Beach Canal STA-1E / C-51 West	6,500	In Progress
1514A	2011	State Expedited project includes Agricultural Area (EAA) Stormwater Treatment Areas (STAs) Expansion	18,000	In Progress
1515	2012	Lakeside Ranch STA - Expedited Project - The SFWMD is implementing as part of Northern Everglades Project	2,700	
1518	2018	C&SF: CERP Henderson Creek/Belle Meade Restoration (CERP Project WBS# 93)	10	
1519	2012	C-43 Water Quality Treatment Area	1,200	
1101	2023	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) (CERP Project WBS# 07)	8,700	In Progress
1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS #01)	12,000	In Progress
1110	2036	C&SF: CERP Central Lake Belt Storage Area (CERP Project WBS# 26)	640	
1115	2015	C&SF: CERP North Palm Beach County - Part 1 (CERP Project WBS# 17) (Formerly Project ID 1503)	1,150	
Completed Projects				
1508	2000	STA-1 West Works and Outflow Pump Station (G-310)	6,700	Completed
1509	2000	STA-2 Works and Outflow Pump Station (G-335)	6,430	Completed
1510	2005	STA-3/4 Works	16,600	Completed
1511	2005	STA-5 Works	4,118	Completed
1512	2006	STA-6 (includes sections 1 and 2)	2,222	completed
1516	2007	LOFT (Identified under LOER) - Nubbin Slough STA Expansion	800	Project cancelled

Everglades Construction Project

As of December 2006, over 45,000 acres of STAs had been constructed by the SFWMD (STAs 1W, 2, 3/4, 5, and 6) and the USACE (STA-1E). During Water Year (WY) 2007, approximately 35,000 acres were in flow-through operation and removing total phosphorus that otherwise would have gone into the EPA. During WY 2007, STA-1E, STA-1W, STA-2, STA-3/4, STA-5, and STA-6 Section 1 removed more than 153 metric tons of total phosphorus, bringing the total removal to over 617 tons since 1994. For WY2007, STA inflow concentrations averaged 187 ppb, while the outflow concentrations averaged 58 ppb. STA performance varied over WY2007 similar to recent water years. Portions of the stormwater treatment areas were being managed for SAV, and the remainder for cattails and other emergent vegetation. The STAs sustained damages from two hurricanes in 2004 and one hurricane in 2005, and portions of the STAs were still undergoing major enhancement projects during WY2007. All of these factors contributed to the less than optimal performance observed in the WY2007 STA performance data.

Everglades restoration is now focused on implementing biologically based (“green”) technologies to the maximum extent possible. This approach is based on manipulating hydrology together with selective vegetation management to create a wetland plant community dominated by emergent plants, SAV, or periphyton (algae). Research has indicated that SAV and periphyton-based STAs (PSTA) have the potential to reach restoration endpoint total phosphorus levels on a consistent basis. The current strategy for improving performance in the STAs includes implementation of the enhancements described in the Long-Term Plan which consist of reconfiguring the treatment cells internally to contain sequences of cells dominated by emergent plants followed by cells dominated by SAV.

Another possible scenario would sequence cells dominated by emergent plants followed by SAV followed by PSTA. The SFWMD and the DEP will continue to investigate ways to exploit green technologies for use in Everglades restoration.

The most significant milestone during this last reporting period was completion of the initial expansions of STA-2, STA-5, and STA-6. These facilities were flow-capable by December 2006, however, due to the drought conditions, water was not available to introduce into these new treatment areas until the summer of 2007. The eastern flow-way, of STA-1E, representing about 20% of the treatment area, currently remains under the control of the USACE for a PSTA demonstration project. Due to the recent severe and prolonged drought period, the PSTA demonstration project start up was delayed. The construction and monitoring of the PSTA demonstration project will limit the hydraulic and treatment capacity of STA-1E through at least December 2009, subject to delays due to weather and other external conditions. After completion of the demonstration project, an undetermined amount of time will be required to remove the test cell levees and structures and return the eastern flow-way to full flow capability. For the purpose of forecasting a performance schedule, it is assumed that flow-through in the eastern flow-way will occur some time after June 2010 subject to the decommissioning of the PSTA project by the USACE; the actual time frame is subject to vegetation establishment and other factors outside the control of the SFWMD.

Northern Everglades and Estuaries Protection Plan

In addition to the water quantity projects detailed under objective 1-A, the Northern Everglades and Estuaries Protection Program will accomplish multiple improvements to water quality in the region as well. The Protection Plans include a Watershed Construction Project which will identify water quality projects that contribute to achievement of TMDLs. The Lake Okeechobee Protection Plan has identified STAs as a critical feature necessary for water quality improvements and is expediting the Lakeside Ranch STA in order to achieve early benefits. Additional STAs will be incorporated into the Protection Plans for the St. Lucie and Caloosahatchee watersheds as the plans are developed. Other stormwater and wastewater treatment projects (e.g., stormwater retrofits, sewer to septic conversions) will be incorporated into the plans as appropriate.

C-111 Spreader Canal

This project enhances the design for the C-111 North Spreader Canal by enlarging pump station S-332E and the extension of the canal under U.S. Highway 1 and Card Sound Road into the Model Lands. The initial design pumps water from the C-111 and the C-111E Canals into a detention area prior to discharging to southern Everglades and Model Lands. It also calls for filling in the southern reach of the C-111 Canal and removal of structures S-18C and S-197.

The PMP ~~for~~ was approved in 2002 and the Tentatively Selected Plan (TSP) was recommended in October 2007. An Alternative Formulation Briefing (AFB) document was forwarded to USACE Headquarters for review and comment and the AFB meeting was held in April 2008. The Project Delivery Team is in the process of developing the PIR and is awaiting a Policy Guidance Memo from USACE Headquarters.

The SFWMD, through its state-expedited initiative, is advancing the design and construction of the project and is anticipating a September 2009 construction date for the Western PIR.

West Palm Beach Canal STA-1E/C-51 West

The original project was modified to include a 6,500 acre stormwater treatment area. In addition to the flood damage reduction benefits of the original project, the modified plan provides water quality treatment, reduction of damaging freshwater discharges to Lake Worth, and increased water supply for the Everglades and other users. Construction of the major project components has been completed and transferred to the SFWMD. Design and construction of the L-40 improvements are scheduled to be completed in 2008 and the field testing of periphyton treatment is scheduled to be completed in 2009. Periphyton is being utilized to aid in the removal and monitoring of total phosphorus found in agricultural and stormwater runoff.

Objective 1-B.2: Prepare locally-based plans to reduce pollutants as determined necessary by the total maximum daily loads by 2011

By the end of the reporting period, the project contributing to objective 1-B.2 was underway.

Biennial Report Table 6 – Plans for Impaired Waters to Comply with TMDLs

1-B.2 Table reflects June 2008 Status of the Project to Prepare Locally-Based Plans to Reduce Pollutants as Determined Necessary by the Total Maximum Daily Loads by 2011				
Project ID	Project Endpoint	Project Name	Output (% of waters having plans)	Status
1600	2011	Total Maximum Daily Load for South Florida		Underway

Total Maximum Daily Loads

The Watershed Restoration Act and the rules DEP has subsequently adopted are intended to identify Florida’s surface waters impaired by pollutants; establish scientifically-based pollutant reduction objectives (TMDLs); develop locally-based plans to reduce pollutants as determined necessary by the TMDL; and promote the physical and financial mechanisms necessary to implement those plans.

DEP has developed a phased approach to implementing the law. DEP’s comprehensive “watershed management” strategy views the state based on its natural boundaries, like river and estuary basins, rather than political boundaries. These naturally bounded areas have been organized into five “groups” of basins. In 2000, DEP began addressing the first group of basins (Group 1) and continues to initiate activities in a new group (Groups 2 through 5) each year over a five-year cycle to cover the entire state. The five-year cycle will then begin again in the Group 1 basins and continue through Groups 2-5 to re-evaluate the status of impaired waters, determine the successes and problems associated with ongoing activities, make necessary changes, and consider and address new circumstances associated with growth and development. The cycle will be repeated methodically and continuously over time.

The status of TMDLs for waters of the South Florida Ecosystem are located in Groups 1-5 and can be found by visiting www.dep.state.fl.us/water/tmdl/index.htm.

OTHER RELATED WATER QUALITY PROJECTS

Northern Everglades and Estuaries Protection Program. Under the Northern Everglades and Estuaries Protection Program (373.4594, F.S.), the SFWMD, in collaboration with DEP and DACS, 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 Lake Okeechobee Phase II Technical Plan, which builds upon the 2004 Lake Okeechobee Protection Plan, was submitted to the Governor and Legislature in February 2008. The Caloosahatchee and St. Lucie River Watershed Protection Plans are due to be submitted for ratification on January 1, 2009.

C-43 Water Quality Treatment Area Project. The SFWMD and Lee County agreed to develop a Water Quality Treatment Area project near the Caloosahatchee River in the C-43 Basin to address total nitrogen treatment, with a focus on organic nitrogen removal, as well as other incidental nutrient treatment of the Caloosahatchee River Basin water upstream of structure S-79.

GOAL 2 ACCOMPLISHMENTS: RESTORING, PRESERVING, AND PROTECTING NATURAL HABITATS AND SPECIES

The second strategic goal of the Task Force concerns natural habitats and species. The Task Force has adopted the following for this goal:

GOAL 2: RESTORE, PRESERVE, AND PROTECT NATURAL HABITATS AND SPECIES

Subgoal 2-A: Restore, preserve, and protect natural habitats

- Objective 2-A.1: Complete acquisition of ~~5.8~~7 million acres of land identified for habitat protection by 2020
- Objective 2-A.2: Protect 20 percent of the coral reefs by 2010
- 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 and 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 2 biological control insects per year for the control of invasive exotic plants
- Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2012

The major projects planned to meet these objectives are listed in the Task Force *Strategy* in part one of this volume (*Coordinating Success*), along with a schedule for their implementation. The projects or activities that were ongoing or completed during the reporting period of July 2004 to June 2006 are described below in the context of progress toward meeting each of the Task Force objectives.

Subgoal 2-A: Restore, preserve, and protect natural habitats

Objective 2-A.1: Complete acquisition of ~~5.8~~7 million acres of land identified for habitat protection by 2020

By the end of the reporting period, state and federal agencies had acquired a total of approximately 4.9 million acres of land identified for habitat protection. As of June ~~2006~~2008 the state had acquired ~~3.6~~3 million acres of habitat conservation land in south Florida at a cost of over \$~~2.3~~5 billion.

Biennial Report Table 7 - Land Acquisition for Habitat Protection

2-A.1 Table reflects June 2008 Status of the Projects to Complete Acquisition of 5.7 Million Acres of Land Identified for Habitat Protection by 2020					
Project ID	Project Endpoint	Project Name	Total Project Acres	Acres Acquired to Date	Acres Remaining To Be Acquired
STATE/SFWMD PROJECTS					
2100		Allapattah Flats/Ranch	40,363	21,709	18,654
2101		Atlantic Ridge Ecosystem	16,002	5,910	10,092
2104		Belle Meade	28,506	18,238	10,268
2105		Big Bend Swamp/Holopaw Ranch	59,656	4,151	55,505
2106		Biscayne Coastal Wetlands	2,026	1,190	836
2107		Bombing Range Ridge	44,439	6,357	38,082
2108		Caloosahatchee Ecoscape	18,497	3,180	15,317
2109		Catfish Creek	19,029	10,184	8,845
2111		Charlotte Harbor Estuary/Flatwoods/Cape Haze	14,990	10,631	4,359
2112		Corkscrew Reg. Ecosystem Watershed (CREW)	69,500	27,460	42,040
2114		Coupon Bight/Key Deer/Big Pine Key	4,014	1,558	2,456
2115		Cypress Creek/Trail Ridge	31,999	3,285	28,714
2117		East Coast Buffer- Natural Lands	49,643	14,737	34,906
2118		Estero Bay	14,378	9,149	5,229
2120		Fakahatchee Strand	80,332	61,054	19,278
2121		Fisheating Creek	176,876	59,910	116,966
2122		Florida Keys Ecosystem	15,336	2,760	12,576
2124		Indian River Lagoon Blueway	1,385	750	635
2125		Juno Hills /Dunes	590	576	14
2127		Kissimmee River (Lower Basin)	75,617	71,642	3,975
2128		Kissimmee River (Upper Basin)	38,273	35,831	2,442
2126		Kissimmee-St. Johns River Connector	9,463	0	9,463
2129		Lake Wales Ridge Ecosystem	16,455	9,782	6,673
2132		Loxahatchee Slough	13,099	12,395	704
2134		Miami Dade County Archipelago	884	505	379
2135		Model Lands Basin	54,458	14,228	40,230
2138		North Fork of the St. Lucie River	3,714	1,232	2,482
2139		North Key Largo Hammocks	5,048	3,544	1,504
2141		Okaloocoochee Slough	35,201	34,982	219
2142		Okeechobee Battlefield	211	145	66
2143		Osceola Pine Savannas	6,357	1,333	5,024
2144		Pal-Mar	35,760	27,878	7,882
2145		Panther Glades	57,604	21,724	35,880
2146		Paradise Run	3,841	3,308	533
2147		Parker-Poinciana/Lake Hatchineha Watershed	6,437	0	6,437
2148		Pineland Site Complex	206	57	149
2149		Rookery Bay	18,721	18,636	85
2150		Rotenberger/Holey Land Tract	79,170	70,833	8,337
2151		Shingle Creek	7,673	2,623	5,050
2152		Six Mile Cypress	2,083	843	1,240
2154		South Savannas	6,046	5,182	864
2155		Southern Glades - Natural Areas	37,620	33,692	3,928
2156		Southern Golden Gate Estates (Save Our Everglades) Picayune Strand	55,247	54,442	805
1111		Ten Mile Creek - Natural Lands	240	113	127
2158		Twelve Mile Slough	15,653	7,486	8,167
2159		Lake Marion Creek and Reedy Creek Management Area (Formerly called Upper Lakes Basin Watershed)	39,323	12,915	26,408
2160		WCAs 2 and 3	721,433	670,844	50,589

2-A.1 Table reflects June 2008 Status of the Projects to Complete Acquisition of 5.7 Million Acres of Land Identified for Habitat Protection by 2020					
Project ID	Project Endpoint	Project Name	Total Project Acres	Acres Acquired to Date	Acres Remaining To Be Acquired
2172		Cypress Creek/Loxahatchee	4,374	4,180	194
2174		Half Circle L Ranch	11,269	0	11,269
2176		Jupiter Ridge	287	271	16
2178		Ranch Reserve	2,217	67	2,150
2185		Devils Garden	82,508	0	82,508
2186		Pine Island Slough Ecosystem	21,583	0	21,583
STATE COMPLETED PROJECTS					
2102		Babcock Ranch	73,542	73,542	0
2110		Cayo Costa Island	1,955	1,955	0
2116		Dupuis Reserve	21,875	21,875	0
2123		Frog Pond- Natural Lands	2,484	2,484	0
1305		Kissimmee Prairie Ecosystem	38,284	38,284	0
2130		Lake Walk-In-Water a/k/a Sumica	4,009	4,009	0
2131		Loxahatchee River	1,912	1,912	0
2137		Nicodemus Slough	2,231	2,231	0
2153		South Fork St. Lucie River	184	184	0
2157		Tibet-Butler Preserve	439	439	0
2161		Yamato Scrub	207	207	0
FCT, STATE PARKS, & WMAs					
		State Florida Communities Trust Lands	26,138	26,138	0
		State Park Lands	101,438	88,600	12,838
		State Wildlife Management Areas	128,279	128,279	0
FEDERAL CONSERVATION LANDS					
2162		A.R.M. Loxahatchee NWR	145,567	143,874	1,693
2164		Big Cypress National Preserve Addition	146,117	143,612	2,505
2163		Big Cypress National Preserve	574,449	573,614	835
2165		Biscayne National Park	172,924	172,590	334
2166		Crocodile Lake NWR	7,100	6,706	394
2167		Everglades National Park Expansion	109,504	108,797	707
2169		Florida Panther NWR	61,573	61,563	10
2168		Florida Keys NWR	415,433	410,000	5,433
2170		Hobe Sound NWR	1,130	1,034	96
2171		J. N. Ding Darling NWR	10,275	8,783	1,492
		Dry Tortugas National Park	64,701	64,701	0
		Everglades National Park	1,399,078	1,398,617	461
TOTAL HABITAT ACQUISITION			5,666,941	4,869,419	797,521

Land Acquisition Strategy and Database

The Task Force Land Acquisition Task Team (LATT) updated the 2006 *Land Acquisition Strategy* with 2007 data and the Task Force accepted it on September 27, 2007. The 2008 document is currently being prepared and approval is anticipated in the fall. The associated database includes local government programs, as well as state and federal land acquisition programs, providing a broad picture of the combined effort for conservation and restoration in the South Florida Ecosystem.

The first *Land Acquisition Strategy* was accepted by the Task Force in February 2003. It was developed as a response to GAO recommendation for a land acquisition plan that identifies and prioritizes additional lands needed to achieve restoration goals. The GAO highlighted the importance of acquiring as much land as possible, and quickly, because undeveloped land in south Florida is becoming increasingly scarce and costly.

Habitat Acquisition

The federal, state, and local accomplishments in land acquisition during the reporting period are shown in *Biennial Report* Table 8.

Biennial Report Table 8 - Land Acquisition Expenditures Summary
2006-2008*

Funding Source	Amount (\$ millions)	Acres
Florida Forever	74.1	12,855.54
Save Our Everglades Trust Fund	252.8	14,067.23
State, Local & Other Funding Sources ¹	132	13,850.99
Land & Water Conservation Fund ²	0	0
TOTALS	\$458.9	40,773.76
¹ The following funding sources are captured in this category: SFWMD ad valorem, county, mitigation, special state appropriations, Preservation 2000, Land Acquisition Trust Fund, and Water Management Lands Trust Fund. ² The Land and Water Conservation Fund is administered by the DOI. * The fiscal year for the DEP is July 1 through June 30. The fiscal year for the SFWMD, the FWS, and the NPS is October 1 through September 30.		

Picayune Strand Restoration

The PIR is complete and the recommended plan will restore and enhance over 55,000 acres of wetlands in the former Southern Golden Gate Estates [development](#) and in adjacent natural areas and public lands by reducing over-drainage [while restoring a natural and beneficial sheetflow of water to the Ten Thousand Islands National Wildlife Refuge](#). [The project includes combination of pump stations with associated spreader canal systems, canal plugs, and road removal, to restore this natural habitat in the western area of Big Cypress Basin, Collier County. Additionally, the project will significantly increase the size of wetlands and improve major wetland ecosystems in adjacent lands including the Fakahatchee Strand State Preserve, Florida Panther National Wildlife Refuge, and Collier Seminole State Park, benefiting threatened and endangered species such as the Florida panther and the red cockaded woodpecker. Water quality and volume delivered to coastal estuaries will be improved by the moderation of large salinity fluctuations caused by freshwater flowing from the Faka Union Canal into the estuaries. The project will also maintain existing flood protection for the Northern Golden Gate Estates and provide public access and recreational opportunities.](#)

[Implementation of the restoration plan will improve the water quality of coastal estuaries by moderating the large salinity fluctuations caused by the freshwater point discharge from the Faka Union Canal at the Port of the Islands. The project includes a combination of spreader channels, canal plugs, road removal, and pump stations in the Western Basin and Big Cypress, Collier County, south of I 75 and north of US 41 between the Belle Meade Area and the Fakahatchee Strand State Preserve.](#)

The State of Florida initiated an early start on this hydrologic restoration project in October 2003. [By early 2007, seven miles of Prairie Canal have been filled and 65 miles of adjacent roadways have been removed. This work is already showing benefits by reducing area drainage in the project area and the adjacent Fakahatchee Strand State Preserve, restoring habitat for threatened and endangered species. Prairie Canal Early Start, Phase 1, backfilled the northern two miles of the canal and successfully reduced drainage of the adjacent Fakahatchee Strand State Preserve and restored habitat for threatened and endangered species. Phases 2 and 3 of the Early Start work will remove the roads adjacent to the canal and backfill the southern five miles to restore sheetflow. Road removal between Prairie Canal and the Merritt Canal was completed by the SFWMD and the remaining road removal efforts are being done as a state-expedited project.](#)

The balance of construction will be implemented by the USACE. The Chief’s Report was signed September 15, 2005 and the Assistant Secretary of the Army completed a review and referred the project to Congress by letter dated April 2, 2007. OMB has also completed their review. WRDA 2007 authorized the project for construction, dependent on appropriations from Congress.

Objective 2-A.2: Protect 20 percent of the coral reefs by 2010

At the end of the reporting period, the initial project contributing to objective 2-A.2 was completed. Additional efforts will be required to expand the protected areas from 10 percent to 20 percent by 2010.

Biennial Report Table 9 – Protect Coral Reefs

2-A.2 Table reflects June 2008 Status of the Projects to Protect 20 Percent of the Coral Reefs by 2010				
Project ID	Project Endpoint	Project Name	Output (Percent of reefs protected)	Status
	2010	Florida Keys National Marine Sanctuary Zoning Action Plan	<u>10%</u>	Underway

Florida Keys National Marine Sanctuary Zoning Plan

The Florida Keys National Marine Sanctuary has implemented a marine zoning action plan that includes a network of fully protected areas, including two ecological reserves (Western Sambo and Tortugas Ecological Reserves), eighteen sanctuary preservation areas, and four research only areas. Combined, these areas fully protect 10 percent of the coral reef resources in the Sanctuary. The Sanctuary met the initial Task Force objective of protecting 10 percent of the coral reefs in this region by 2006. It is currently monitoring the biological, ecological, and socioeconomic changes resulting from the full protection of these areas and will use the information learned to ~~to~~ extend protection to 20 percent of the coral reefs by 2010. (Not yet updated) determine the efficacy of full protection. This will inform a comprehensive review of the zoning scheme to evaluate the benefits of additional protection and/or alternative to increase full protection to 20% of coral reefs by 2010.

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

At the end of the reporting period, six projects were underway.

Biennial Report Table 10 – Improve Habitat Quality

2-A.3 Table reflects June 2008 Status of the Projects to Improve Habitat Quality for 2.4 Million Acres of Natural Areas in South Florida				
Project ID	Project Endpoint	Project Name	Output (Acres of Habitat)	Status
<i>Note – 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. However, appropriate measures by project are currently being developed through the establishment of interim goals. There are some projects included in this tracking matrix that exemplify how this objective will be achieved and are listed below. (USACE)</i>				
2300	2010	C&SF: CERP Strazzulla Wetlands (CERP Project WBS# 39)	3,335	
2301	2010	C&SF: CERP Winsberg Farms Wetlands Restoration (CERP Project WBS# 91)	114	In Progress
2302	TBD	C&SF: CERP Lakes Park Restoration (CERP Project WBS# 94)	60	In Progress
2303	2022	C&SF: CERP Restoration of Pineland and Hardwood Hammocks in C-11 Basin (CERP Project WBS# 92)	50	In Progress
2304	TBD	A.R.M. Loxahatchee NWR Prescribed Fire Program	84.5	In Progress
2306	2009	C&SF: CERP Acme Basin B Discharge (CERP Project WBS #38) (was 1100)	365	
2307	2015	C&SF: CERP Picayune Strand Restoration (CERP Project WBS# 30)	55,000	In Progress
2309	2015	C&SF: CERP Biscayne Bay Coastal Wetlands (CERP WBS# 28)	1,695	
2310	2011	C&SF: CERP C-111 Spreader Canal (Formerly Project ID 1517)(CERP Project WBS# 29)	TBD	
1101	2023	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) (CERP Project WBS# 07)	97,880	
1104	2015	C&SF: CERP Lake Okeechobee Watershed (CERP Project WBS# 01)	3,730	
1107	2013	C&SF: CERP Site 1 Impoundment and ASR (CERP Project WBS# 40)	114	
1111	TBD	E&SF: Critical Projects - Ten Mile Creek	2,740	
1116	2017	C&SF: CERP Broward County WPAs (C-9 Stormwater Treatment Area/Impoundment and Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management) (Formerly Project ID 1501) (CERP Project WBS# 45)	4,633	In Progress
1303	2015	E&SF: Critical Projects: Southern CREW	4,090	
1306	2013	Kissimmee River Restoration Project	27,000	
1307	2013	Modified Water Deliveries to Everglades National Park	190,000	
3902	2016	C&SF: CERP Wastewater Reuse Technology Pilot Project (CERP WBS# 37) (Formerly Project ID 3802)	3,500	

Winsberg Farms Wetlands Restoration

The Winsberg Farm project was included in the 1999 Restudy as an "Other Project Element". Projects in this category were determined to be consistent with planning objectives and have a federal interest, but were too small in scale to evaluate from a system-wide perspective. The non-federal partner for USACE is Palm Beach County's Water Utilities District (PBCWUD). The project seeks restoration of approximately 114 acres of wetlands on former agricultural lands using treated wastewater from PBCWUD's Southern Region Wastewater Reuse Facility. Project lands totaling approximately 175 acres were acquired by PBCWUD from the Winsberg family. As a result of a condition of the real estate purchase agreement, Phase 1 of the project (approximately 72 acres of wetlands, plus a parking lot, visitor center, and recreational access features) was constructed. PBCWUD completed construction of Phase 1 in 2004 and renamed the project "Green Cay Wetlands".

A draft PIR was completed in February 2008 and was released for public and agency comment. The draft report recommends credit for PBCWUD's share of the project, and if approved, will be submitted to the Secretary of the

Army to authorize federal funds for the construction of the Phase 2 portion of the project (the remaining 42 acres). The Final PIR is expected to be submitted to the Secretary of the Army for review late in 2008.

Biscayne Bay Coastal Wetlands

The goal of the project is to improve the current ecological health of Biscayne Bay by adjusting the quantity, quality, timing, and distribution of freshwater entering Biscayne Bay and Biscayne National Park. The primary means envisioned to accomplish this goal is through the redistribution of freshwater flow and the expansion and restoration of wetlands adjacent to southwestern Biscayne Bay (in Miami-Dade County). This project will also enhance recreational opportunities in Biscayne Bay and adjacent wetlands.

An AFB was held in early December 2007 and a guidance memorandum was received from USACE Headquarters in April 2008. In February 2008 it was decided to divide the project into two phases. Phase I of the project will consist of the design and construction of two essential components, the Deering Estate Flow-way and the Cutler Ridge Wetlands. Phase II of the project will include the remainder of the project features not included in Phase I. The PDT is proceeding forward with the preparation of a draft PIR for Phase I, which is currently scheduled for release for public comment towards the end of this calendar year. Work on the draft PIR for Phase II is scheduled to start next calendar year. [Work on the draft PIR for Phase II is scheduled to start in 2009.](#)

Manatee Pass Gates

Installation of the Manatee Protection System (MPS) at S-78, Ortonia Lock, is near completion, and the contractor is preparing closeout documents. The installation of the MPS at S-77, Moore Haven Lock, has been postponed until FY 2009; instead the contract for installation of the MPS at S-80, St. Lucie Lock, was awarded the week of April 28, 2008. In June 2008, construction work will be performed concurrently on S-308, Port Mayaca, and S-80, St. Lucie Lock, to minimize lock closures. Task orders for subsequent gates (W.P. Franklyn Lock and Taylor Creek Lock) are expected in the winter of 2008.

Acme Basin B Discharge

Work on a draft PIR had been suspended. However, the SFWMD, through its state-expedited project initiative, proceeded with the design and construction in advance of the scheduled 2009 construction date with most of the construction completed in 2007.

The Loxahatchee Impoundment Landscape Assessment

The SFWMD has a cooperative agreement with the USFWS to conduct long-term research in four large ridge and slough impoundments on the Arthur R. Marshall Loxahatchee NWR LILA facility. LILA is needed to inform the development of several CERP performance measures of a healthy South Florida Ecosystem. LILA is serving as a pilot study for hydrologic regimes proposed under the CERP. Key Everglades landscape features were sculpted from existing NWR impoundments, and modified with controlled hydrologic regimes with flow rates that simulate historic flows. This design has given LILA the unique capability of measuring responses by wading birds, tree islands, and ridge and slough communities to sustained inflows of low nutrient water. The LILA fills key information gaps of the CERP and gives the public a rare opportunity to see restored Everglades habitats.

Other Natural Habitat and Species Projects

South Florida Multi-Species Recovery Plan. A final implementation schedule for the Multi-Species Recovery Plan (MSRP) was completed and announced in the Federal Register on March 26, 2007. The MSRP and the implementation schedule are to be used by state and federal agencies, tribes, nongovernmental organizations, and other partners who are committed to endangered and threatened species conservation and to restoration of the South Florida Ecosystem. The implementation schedule prioritizes certain recovery actions in the MSRP, as well as providing time and cost estimates for those actions. Participants to complete those actions are also identified.

American Crocodile Reclassification in Florida. On April 19, 2007, the American crocodile in Florida was reclassified from endangered to threatened. The American crocodile, which occurs only in south Florida in the United States, was listed as endangered in 1975. Loss of nesting habitat, killing for sport, and disturbance to

individuals, nest sites, and habitat led to widespread population decline. In 1975, the crocodile population in Florida was estimated to contain 10-20 breeding females. Today, the population in Florida is estimated to be 1,400-2,000 individuals (excluding hatchlings), including greater than 90 nesting females. The nesting range has expanded to include Key Largo, Biscayne Bay, Florida Bay, and occasional nests on the southwest coast. Approximately 95 percent of the remaining habitat in south Florida has been acquired by federal, state, or county agencies and is now protected from development.

Wildlife Returns to Picayune Strand. The FWC recently documented the birth of two female panther kittens in southwest Florida. Born on April 1, 2007, the mother and babies have made a den in the restored portion of Picayune Strand. This is proof positive that restoration efforts are working and wildlife is beginning to flourish in this region of the South Florida Ecosystem. Completing the Picayune Strand Restoration Project, a state-expedited project, will greatly improve panther habitat. Since 1981, scientists have fitted many Florida panthers with radio collars, a common remote sensing tool, to help keep track of their movements, habitats, and land use patterns. The collars release radio waves that can be sensed by a special receiver. Currently, 30 panthers, including the kittens' mother, have radio collars. FWC has documented over 20 panther kitten births in Florida in 2007.

Completion of land acquisition, road removal, and implementation of ecosystem management principles in Picayune Strand will further aide in the panthers' ability to feed, reproduce, and find shelter. Restoration will also improve habitat conditions for the panthers' prey, and a more restricted human presence will produce larger areas for the panthers to roam. With a completion date of 2010, the project will return the natural water flow across 85 square miles in western Collier County, drained in the early 1960s for residential development.

Key Deer Recovery. Prior to its listing as endangered in 1967, the Key deer population may have numbered as few as 50 individuals. Today, there are about 600 deer in the core portion of its range, Big Pine Key and No Name Key. Approximately 100 additional deer occur on keys outside of the core. Through translocations from the core, the FWS has augmented herds on the two keys within the species' range farthest from the core, Cudjoe and Sugarloaf. The MSRP serves as the current recovery plan for the deer and does not provide delisting criteria. The FWS is currently revising the recovery plan and anticipates completing a technical/agency draft in late 2008. This updated plan will contain criteria for both reclassification to threatened and delisting.

Reprogrammed Funds. In 2004, the FWS' South Florida Ecological Services Office received \$8.29 million from Congress to expend on threatened and endangered species recovery and restoration projects. The FWS has developed contracts and agreements to implement high-priority research projects and management actions to aid in achieving recovery of threatened and endangered species and to develop effective habitat restoration projects. As of October 2007, all of the reprogrammed funds have been obligated, committed, or spent. Based on existing contracts and modifications, all funds will be spent by September 2009. In total 70 individual agreements and 12 purchase orders for services or goods have been completed. In implementing projects under the reprogrammed funds, the focus has been on working to ensure integration among related projects and ongoing research efforts funded by other agencies or organizations. In addition, FWS has focused on encouraging research in an applied context that provides meaningful information to aid in recovery of listed species, planning under CERP and other restoration projects, and resource management. Several important projects on candidate plants in the Florida Keys have been completed. Critical projects that are under way include research and monitoring of Cape Sable seaside sparrows, Florida grasshopper sparrows, Key Largo wood rats, and wading birds and conservation of endangered scrub plants. In developing contracts for research, the FWS has been promoting research grants that make use of the Cooperative Ecosystem Studies Units (CESU) that have been established to help provide assistance to managers in federal land management, and environmental and research agencies.

Subgoal 2-B: Control invasive exotic plants and animals

In December 2007, the Task Force reviewed the subgoals and objectives of the strategic plan. Changes to Subgoal 2-B include the consideration of invasive exotic animals and modification of the objectives regarding invasive exotic plants.

Noxious Exotic Weed Task Team

NEWTT has been coordinating on three primary projects. The first project included the development of an exotic plant indicator as part of the System-wide Indicators for the Task Force. This includes the development of a performance measure, conceptual ecological model, and communication tool for invasive exotic plant indicators. This indicator has been completed and is under review for publication and is being reported in this 2008 Biennial Report. The second task has been the development of a PIR with the USACE and the SFWMD for biological control of plants. The USACE PIR was started in July 2005 and the anticipated completion date is April 2009. The anticipated development of a master plan has been postponed indefinitely as no agency has agreed to lead in this effort.

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

At the end of the reporting period, the project contributing to objective 2-B.2 was underway.

Biennial Report Table 11 - Maintenance Control of Invasive Species on Public Lands

2-B.1 Table reflects June 2008 Status of the Project to Achieve Maintenance Control of Brazilian Pepper, Melaleuca, Australian Pine, and Old World Climbing Fern on South Florida’s Public Conservation Lands by 2020				
Project ID	Project Endpoint	Project Name	Output (control)	Status
2501	2009	Monitoring the Effects of Repeated Aerial Herbicide Application on Lygodium microphyllum and Native Vegetation.		
2502	TBD	Invasive exotic plants control in terrestrial and aquatic natural systems		
2503	TBD	Invasive Species Research and Information Exchange		
2504	TBD	Develop and implement a FWS Florida Invasive Species Strike Team		
2505	2026	C&SF:CERP - Melaleuca Eradication and Other Exotic Plants(Formerly Project ID 2602) (CERP Project WBS# 95)		
2506	TBD	Everglades National Park Exotic Control Program (Formerly Project ID 2604)		
2507	2017	Hole-in-the-Donut (Formerly Project ID 2606)		
2508	TBD	Aquatic and Upland Invasive Plant Management		
2509	2014	Exotic Species Removal (Formerly Project ID 2605)		
2510	TBD	Exotic Vegetation Control (Critical) Big Cypress National Preserve (Formerly Project ID 2607)		

Florida Department of Environmental Protection Efforts

Current efforts on melaleuca have achieved remarkable success in the use of chemical control on public lands within the EPA. During the 2006-2007 fiscal years, maintenance control was conducted on approximately 4,700 acres of melaleuca within ENP. This was accomplished with \$778,000 from the BIPM Uplands Program and \$135,000 of NPS funds. An estimated 5,000 acres of melaleuca is all that remains for initial control in ENP. Melaleuca maintenance control is conducted in the WCAs each year through a partnership between the DEP and the SFWMD. For 2006-2007, a total of 53,617 acres was treated at a cost of \$1,902,000 from the Uplands Program and \$1 million in SFWMD funds. With the development and release of two biological control insects and the anticipated release of two additional insects, monitoring information indicates that melaleuca may well be a species that will no longer be a serious pest of natural areas in Florida by 2020.

However, Old World climbing fern (*Lygodium*) is now considered the most serious south Florida invader. As a fern, it reproduces by microscopic spores that are spread across the state with every hurricane. Control efforts are underway on conservation lands, but the amount of infested acres in the EPA is unknown. Between 1998 and 2007 the BIPM Uplands Program expended over \$15 million to control 55,000 infested acres. Initial control of 3,500 acres of *Lygodium* in ENP was conducted during 2006-2007 with \$300,000 from the Uplands Program and \$25,000 of NPS money. This contrasts with the very large need throughout south Florida (see Loxahatchee NWR, below). Research is being conducted on biological and chemical control methods. The first biocontrol agent for *Lygodium* was released in 2005 and a second insect has been approved for release.

Second to *Lygodium*, Brazilian pepper is the most widespread invasive in south Florida. Although easily controlled through chemical or mechanical means, this species was planted throughout south Florida for over one hundred years. Some estimates place the extent of Brazilian pepper in south Florida (on public and private lands) at hundreds of thousands of acres. By way of comparison, the BIPM Uplands Program has controlled 70,000 acres of pepper on public conservation lands since 1997. The USDA biological control program for Brazilian pepper has one candidate species for release, but approval appears to be held up in administrative regulatory procedures. Brazilian pepper is and will continue to be an extremely widespread and serious threat to natural areas of Florida.

Australian pine is an easy species to control; however, control is often quite expensive since it can involve heavy machinery. Trees are also often located near roads, power lines, houses, and other infrastructure, raising safety concerns (and additional costs). From a control perspective, Australian pine is a much less serious problem than melaleuca, *Lygodium*, and Brazilian pepper. Nonetheless, it is a severe ecological threat to natural areas and should be removed from the remaining conservation lands where it occurs.

Loxahatchee National Wildlife Refuge Exotic Management

During the 2006-2008 reporting period, 56,600 acres of the Arthur R. Marshall Loxahatchee NWR interior were treated by DEP for both melaleuca and *Lygodium*. Approximately 21,600 acres of *Lygodium* were aerially treated on heavily infested islands in the northern interior. The remaining 35,000 acres were covered and treated by ground crews. State funding from the BIPM Uplands Program totaled approximately \$4,390,000 for this work.

Approximately 32,800 acres were initially treated by USFWS for one or both exotic plant species, Old World climbing fern and Melaleuca. 15,000 acres were re-treated for all exotic plant species.

The FY 2008 base and special funding for USFWS will be applied to more initial ground treatments of Old World climbing fern (\$376,000), additional initial aerial treatment of both Old World climbing fern, Melaleuca, and Brazilian pepper (\$1 million), and ground re-treatments of all exotics (\$2.5 million). Heavily infested areas must receive a second and even third treatment in order to achieve maintenance control.

Melaleuca Control Program – Melaleuca Eradication and Other Exotic Plants

The USACE and the SFWMD amended the CERP design agreement to include this project. The PIR is being developed by the PDT with the AFB meeting held ~~in on March 10, 2008~~ August 2007. The PIR is focusing on the mass rearing and controlled release of biological agents to control melaleuca, Brazilian pepper, Australian pine, and Old World climbing fern. The publication of the final PIR in the Federal Register is scheduled for April 2009. This project can be authorized by the Secretary of the Army under the WRDA 2000 Programmatic Authority without additional congressional authorization ~~PIR approval is scheduled for June 2009 with a recommendation for congressional authorization in WRDA 2009.~~

Special Report on Invasive Species

The USACE contracted with the DOI invasive species specialist to produce a special report on the federal role in invasive species management for Everglades restoration and to make recommendations on further federal involvement. This report was completed in November 2005 and recommends development of a Master Plan for management and control of invasive and exotic species.

Removal of Exotic Plants from Big Cypress National Preserve

In 2003 Big Cypress National Preserve completed initial treatment of melaleuca in the originally estimated 150 square miles infested with this invasive exotic tree. Follow-up treatments in areas of previous control have been ongoing, and were continued each of the years since. With initial treatments of melaleuca completed, more resources have been applied to control Brazilian pepper. The Preserve's strategy has been initially to eliminate some of the largest seed-source populations to reduce exotic propagule introduction from these densely populated areas, and to allow these areas to be restored to native biological communities. Treatment of *Lygodium* has been underway for several years and all known populations have been treated or are now being treated. Surveillance for *Lygodium* continues and because of its prolific ability to spread, additional discoveries and treatment strategies are needed.

Many other exotic trees and shrubs are routinely eliminated during exotic management treatments. During fiscal years 2006 and 2007, the BIPM Uplands Program funded control of 8,101 acres of Brazilian pepper and *Lygodium* at a cost of \$474,000. This continued funding that has been provided to the Preserve since 2000, with a total outlay as of 2007 of \$1.1 million of DEP funds and \$462,000 of matching NPS funds.

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

In December 2007, the Task Force adopted a new Objective 2-B.2 that focuses on biological controls for invasive exotic plants. The inclusion of this objective helps to better describe the suite of activities necessary to address the issue of invasive exotic plants in the South Florida Ecosystem. At the end of the reporting period, the projects contributing to objective 2-B.2 were underway.

Biennial Report Table 12 – Biological Control of Invasive Species

2-B.2 Table reflects June 2008 Status of the Project to Objective 2-B.2: Release 2 biological control insects per year for the control of invasive exotic plants				
Project ID	Project Endpoint	Project Name	Output (control)	Status
2601	TBD	Casuarina Biological Control Agents		
2602	TBD	Lygodium Biological Control Agents		
2603	TBD	Melaleuca Biological Control Agents		

The USDA Fort Lauderdale Quarantine facility has been working on biological control agents for seven invasive exotic pests including: water hyacinth, Old World climbing fern, melaleuca, Brazilian pepper, air potato, skunk vine, and lobate lac scale.

- Two insects are being tested in quarantine for water hyacinth, a plant hopper, and a stem boring fly.
- Three insects have been cleared and released for Old World climbing fern and one has become established in the field.
- Three insects have been cleared and released for melaleuca. One of these insects, a stem galling midge, appears to be establishing and looks like it may be very effective.
- Four insects are being tested in quarantine for Brazilian pepper.
- Testing on a leaf beetle for air potato has been completed and the petition for release submitted.
- Two insects are being tested in quarantine on skunk vine and one of the insects appears to be very effective and is expected to be successful once released.
- Four insect parasites of lobate lac scale have concluded their testing in quarantine. One of the four parasitic insects passed the testing protocols and looks likely for petitioning for release.

Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2012

In December 2007, the Task Force adopted a new Objective 2-B.3 to begin addressing invasive exotic animals within the strategic plan. The inclusion of this objective also required modification of the subgoal language itself and is anticipated to be an increasingly important component of the strategic plan moving forward. At the end of the reporting period, the project contributing to objective 2-B.3 was underway.

Biennial Report Table 13 - Achieving Eradication of Gambian Pouch Rat

2-B.3 Table reflects June 2008 Status of the Project to Objective 2-B.3: Achieve eradication of Gambian pouch rat by 2012				
Project ID	Project Endpoint	Project Name	Output (control)	Status
2700	2011	Eradication of Gambian Pouch Rat		Underway

In February 2006, a pilot eradication project was initiated on Crawl Key where Gambian pouch rats were recorded in 2005. In June 2006, the USDA Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) deployed 94 bait stations. Supplemental trapping was done to obtain rats for radio telemetry. It was determined that the combined effects of the eradication effort, along with impacts from Hurricane Wilma, eliminated this sub-population. Using information from previous trapping and radio telemetry work, a bait-station grid was established for Grassy Key. From January to May, 2007, 1,000 bait stations were placed throughout Grassy Key hammock and residential areas. Between May 21st and June 15th, the final eradication effort commenced with roughly 600 stations around the periphery of the original core area. Intensive surveys using remote cameras and trapping were conducted in July and September, 2007, and will be repeated for the next five years to detect and eliminate any surviving Gambian pouch rats.

GOAL 3 ACCOMPLISHMENTS: FOSTERING COMPATIBILITY OF THE BUILT AND NATURAL SYSTEMS

The third strategic goal of the Task Force is fostering compatibility of the built and natural systems. The Task Force has adopted the following for this goal:

GOAL 3: FOSTER COMPATIBILITY OF THE BUILT AND NATURAL SYSTEMS

Subgoal 3-A: Use and manage land in a manner compatible with ecosystem restoration

- Objective 3-A.1: Prepare a land use analysis for selected restoration projects
- Objective 3-A.2: 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.3: 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.4: Increase the number of local governments that adopt into their comprehensive plans (goals, objectives, policies, and related strategies) - concepts compatible with South Florida Ecosystem Restoration
- Objective 3-A.5: Increase the use of educational programs and initiatives to further the publics' and local governments' 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: Maintain or improve existing levels of flood protection for the urban, agricultural, and natural environments

Subgoal 3-C: Provide sufficient water resources for built and natural systems¹¹

- 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

The major projects planned to meet these objectives are listed in the Task Force *Strategy* in part one of this Volume (*Coordinating Success*), along with a schedule for their implementation. The projects or activities that were ongoing or completed during the reporting period of July 2006 to June 2008 are described below in the context of progress toward meeting each of the Task Force objectives.

¹¹ The legal authority and requirements for water supply planning are included in Chapters 373, 403, and 187 Florida Statutes. During the State of Florida's 2005 legislative session, lawmakers revised state water law. This has led to the SFWMD reporting increased water supply in Objective 3-C.2 in the alternative water supply program and deleting the Objective 3-C.1 as a measurable output of increased water. The regional water supply plans are still being done but the increased supply is being funded through the Alternative Water Supply Development Program.

Subgoal 3-A: Use and manage land in a manner compatible with ecosystem restoration

In December 2007, the Task Force reviewed the subgoals and objectives of the strategic plan. Many of the objectives under Subgoal 3-A were updated to reflect current needs and challenges as well as to reflect many of the innovative initiatives underway within the ecosystem.

Integrated Land Use and Water Supply Planning

The Florida DCA, DEP, and water management districts are implementing 2005 legislation that requires local governments to address current and future water supply needs of their communities. The statutory changes require local governments to ensure that future land use plans are based on the availability of adequate water supplies and the necessary public treatment and distribution facilities. Local governments must also amend their comprehensive plans to identify and incorporate alternative water supply projects, and include a 10-year water supply facilities work plan that shows a commitment to the construction, operation, and financing of the identified projects. The local government work plan must be consistent with the appropriate regional water supply plan adopted by the SFWMD.

During the reporting period, the SFWMD adopted four regional water supply plans, which blanket its district, border to border – Upper East Coast, Lower East Coast, Lower West Coast, and Kissimmee Basin. Each of the SFWMD's regional water supply plans concluded that the water supply for future residents must come from alternative sources. Furthermore, the potential for developing additional traditional sources is limited by the need to protect water for the natural system. In the case of the Lower East Coast plan, the SFWMD approved the plan concurrently with a new Regional Water Availability Rule, which precludes additional water withdrawals that would place new demands directly or indirectly on the Everglades. The Lower East Coast plan was based on the new rule.

There are a total of 153 local governments within the boundaries of the SFWMD that are subject to one of the four regional water supply plans. Local governments subject to the Lower West Coast and Upper East Coast plans had until January 2008 to develop and incorporate elements of their 10-year water supplies facilities work plan into their local government comprehensive plans. The local governments subject to the Kissimmee Basin plan had until June 2008 and those affected by the Lower East Coast plan have until August 2008 to do the same. In April 2008, the DCA in conjunction with the SFWMD launched an informal technical assistance initiative to identify the local governments most in need of assistance in complying with this law. This includes helping local governments identify which projects in the regional water supply plan they intend to build and identify other alternative water supply projects that they will build as a substitute for a recommended project or in addition to a recommended project. This process and the subsequent amending of local government comprehensive plans will take place over the next two years.

Florida Greenways and Trails Designation Program

At the end of the reporting period, the Florida state-wide system of greenways and trails contained 298,777 acres plus an additional 147 linear miles of greenways and trails land in the 16-county area corresponding in whole with the SFWMD boundary.¹² The primary mission of this program is to provide a recreational trail or greenway experience within 15 minutes of every residence and business within the state.

Lake Okeechobee Scenic Trail

Design and construction of the Lake Okeechobee Scenic Trail (LOST) began in 2003. This project will create a 110-mile multi-purpose trail on top of the Herbert Hoover Dike around Lake Okeechobee. November 2005 marked the official opening for Phases 1 and 2, consisting of 26 and 36 miles respectively, of an 11 foot wide asphalt

¹² The SFWMD encompasses all of Broward, Collier, Glades, Hendry, Lee, Martin, Miami-Dade, Monroe, Palm Beach, and St. Lucie Counties, as well as portions of Charlotte, Highlands, Okeechobee, Orange, Osceola, and Polk Counties.

multipurpose trail with an adjacent three foot hiking tread. Phases 1 and 2 were constructed by the Florida Department of Transportation using \$12.5 million of the state’s federal enhancements funds. The DEP’s Office of Greenways and Trails submits annual requests for funding to complete the remaining 48 miles of trail, which is expected to cost an additional \$12.5 million. To date, there have been two \$1 million allocations that will complete three miles of trail in the Fisheating Creek area where there is no levee to build the trail on, and fund a pedestrian bridge over Taylor Creek. Completion of the entire trail is contingent upon funding. Other projects underway include the Glades County Economic Development Council partnering with local Visit Florida partners to do a “wayfinding” project for LOST trailheads in Glades County. In addition, Palm Beach County received \$1 million to construct plazas and entryways into the Palm Beach County “Glades Communities” trail system, which will connect with the LOST.

The project will make Lake Okeechobee accessible to pedestrians, backpackers, bicyclists, equestrians, sightseers, naturalists, skaters, picnickers, campers, and fishermen, allowing the surrounding communities to appreciate this great natural resource and the derived economic benefits.

Objective 3-A.1: Prepare a land use analysis for selected restoration projects

Land Use Compatibility Analyses

Beginning in December 2007, the DCA launched an initiative to analyze current and future land uses in the South Florida Ecosystem. The purpose of this analysis is to identify potential conflicts and/or opportunities for management of that land in a manner that is compatible with South Florida Ecosystem restoration. As an initial starting point, and with input from the Task Force and the SFWMD, the following four CERP projects and their surrounding land uses were chosen as “pilot” projects:

1. C-111 Spreader Canal
2. Biscayne Bay Coastal Wetlands
3. IRL-S - C-23/24 South Reservoir
4. Lake Okeechobee ASR

The DCA will analyze the relationship between the CERP project and its surrounding current and future land use categories to identify potential land use conflicts and incompatibility. As additional analyses are conducted over time, the findings may lead to the development of model local government comprehensive plan goals, objectives and policies to address the avoidance of land use impacts that conflict with South Florida Ecosystem restoration and ensure that restoration projects are considered in future land use decisions. This project may also lead to opportunities to educate local public officials about the impacts and opportunities for ecosystem restoration at the local government level.

At the end of the reporting period, the project contributing to objective 3-A.1 was underway.

Biennial Report Table 14 – Florida Greenways and Trails Program

3-A.1 Table reflects June 2008 Status of the Project to Prepare a land use analysis for selected restoration projects				
Project ID	Project End Date	Project Name	Output (additional acres)	Status
3100	2010	Analysis of Land Use Patterns Surrounding CERP Projects		

Objective 3-A.2: 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 ¹³

At the end of the reporting period, the projects contributing to objective 3-A.2 ~~was~~ were underway.

Biennial Report Table 15 – Additional Park, Recreation, and Open Space Land

3-A.2 Table reflects June 2008 Status of the Project to Designate or Acquire an Additional 10,000 acres of lands needed for Park, Recreation, and Open Space to complement South Florida Ecosystem Restoration through local, state and federal programs by 2013				
Project ID	Project End Date	Project Name	Output (acres/miles)	Status
	2007	Florida Communities Trust Grant Program	1,000 acres	Underway
3200	Ongoing	Florida Keys Overseas Heritage Trail (Formerly Project ID 3301)		Underway
3201	Ongoing	Lake Okeechobee Scenic Trail (Formerly Project ID 3102)		Underway
3202	2009	Florida Greenways and Trails Program (Formerly Project ID 3100)	10,000	Underway

Florida Communities Trust Grant

In the 2006-2008 state fiscal years, \$60.8 million of state funds and \$73.2 million of local funds were spent through this program to acquire 4,331 acres in the South Florida Ecosystem. The local governments in south Florida have utilized this program as a resource to increase open space; provide recreational opportunities; provide public water body access; preserve natural, cultural and historical resources; and create flood and stormwater treatment solutions in a park setting.

CERP Master Recreation Plan

The draft PMP for the CERP Master Recreation Plan (MRP) was released for public comment on February 23, 2004. The MRP will coordinate CERP recreation with other known public and private recreation plans. The plan is a 'living document' to guide planners in a system-wide approach to identify, evaluate, address, and recommend recreation activities, facilities, and aspects of CERP implementation. This includes not only existing recreation use within the South Florida Ecosystem, but also potential new recreation, public use, and public educational opportunities. In 2006, the planning team hosted a series of meetings and received public input on existing recreation conditions, future recreation needs, and recreation trends and issues. Development of the recreation performance measures was completed in May 2006.

The USACE and the SFWMD conducted another series of public meetings throughout south Florida in April and May of 2008 to present and receive feedback on regionally based recreation conceptual plans for the CERP MRP. Comment forms, fact sheets, regional conceptual plan maps, the Regional Conceptual Recreation Plans Draft Report, a public meeting presentation, and other read-ahead materials/materials for review and comment for the MRP are available at: www.evergladesplan.org/pm/progr_master_rec_plan.cfm.

¹³ This is a statewide goal: a regional breakout was not available from the reporting agency at the time this goal was established by the Task Force.

Objective 3-A.3: 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

At the end of the reporting period, the two projects contributing to objective 3-A.3 were both underway.

Biennial Report Table 16 – Participation in Voluntary Farm Bill Conservation Programs

3.A-3 Table reflects June 2008 Status of the Projects to 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				
Project ID	Project End Date	Project Name	Output (Annual additional acres)	Status
3300	2011	Technical Assistance to Indian Reservations (Formerly Project ID 3201)	107,000	Underway
3301	2007	2002 Farm Bill Conservation Programs (Formerly Project ID 3202)	1,106,108	Underway

Farm Bill Conservation Programs

In 2006-2008, a total of 229, 395 acres in the 16-county south Florida region were enrolled in Farm Bill conservation programs at an obligated cost of \$56,072, 264. Biennial Report Table 17 reflects the achievement during this reporting period by specific programs.

Biennial Report Table 17 – Farm Bill Accomplishments
2006-2008

Program	Dollar Amount	Acreage Enrolled
Wetlands Reserve Program	\$37, 428,264	8,779 acres
Environmental Quality Incentive Program	\$18,200,000	208, 866 acres
Wildlife Habitat Incentives Program	\$444, 000	11, 750 acres
TOTALS	\$ 56, 072, 264	229, 395 acres

The Wetlands Reserve Program is a voluntary program to assist landowners in restoring wetlands that have had wetlands functions reduced or eliminated by agricultural production practices. Priority is given to those lands that will maximize wildlife habitat. Permanent and 30-year conservation easements provide financial incentives for wetlands enhancement in exchange for retiring marginal agricultural lands.

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program from the USDA Natural Resources Conservation Service. It supports production agriculture and environmental quality as compatible goals. Through EQIP, farmers may receive financial and technical help with structural and management conservation practices on agricultural land.

The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP, USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed.

Objective 3-A.4: Increase the number of local governments that adopt into their comprehensive plans (goals, objectives, policies, and related strategies) - concepts compatible with South Florida Ecosystem restoration

Biennial Report Table 18 - Comprehensive Plan Compatibility

3-A.4 Table reflects June 2008 Status of the Projects Contributing to Increase the Number of Local Governments that adopt into their Comprehensive Plans (goals, objectives, policies, and related strategies) - Concepts Compatible with South Florida Ecosystem Restoration				
Project ID	Project End point	Project Name	Output	Status
3400	2010	Consideration of Land Use Policies and Planning by Local Governments with CERP		

Local Government Comprehensive Plan Research and Assessment

In conjunction with the project described under objective 3-A.1, the DCA is conducting baseline research to identify the level of protection and consideration given to South Florida Ecosystem restoration in local government comprehensive plans. The research is simple and involves the following three steps:

1. Identify each local government with a CERP project or projects located within its political boundaries.
2. Determine whether the local government comprehensive plan contains goals, objectives, or policies that specifically address South Florida Ecosystem restoration, Everglades’ protection, recognition of the CERP project(s), etc.
3. Create a database containing the results of the research.

Once the research is complete and the database created, the DCA will initiate a local government outreach effort. This will include working with local governments through the local government comprehensive plan evaluation and appraisal report process to strengthen the plans and local government decision-making in a manner that supports and complements South Florida Ecosystem restoration.

Objective 3-A.5: Increase the use of educational programs and initiatives to further the publics’ and local governments’ understanding of the benefits of South Florida Ecosystem restoration

At the end of the reporting period, the projects contributing to objective 3-A.5 are underway.

Biennial Report Table 19 - Increase Community Understanding

3-A.5 Table reflects June 2008 Status of the Projects to Increase the use of educational programs and initiatives to further the publics’ and local governments’ understanding of the benefits of South Florida Ecosystem restoration				
Project ID	Project Endpoint	Project Name	Output	Status
3502	Ongoing	USACE Outreach Program	Public meetings, speakers bureau, presentations at conferences, symposia and interest group meetings, environmental education, newsletters: Everglades Report and Community Outreach in Action, community events, media relations and extensive use of the web.	Ongoing
3503	Ongoing	SFWMD Outreach Program		Ongoing

CERP Outreach and Regional Coordination

The USACE and SFWMD continued to make much progress during this reporting period to raise awareness of central and south Florida's public-at-large and socio-economically impacted communities about CERP, and continued some of these efforts at the state or national level. Innovative products, unique delivery methods, and public involvement all helped ensure that CERP was better understood and that the public had opportunities to participate in decision-making. Between July 2006 and June 2008, the USACE:

- Distributed at least 425,000 newspaper inserts, brochures, CDs, promotional items, and other materials about CERP.
- Prepared special materials for Haitian Americans about CERP, including a new poster and bookmark and related media campaign in 2008.
- Continued to translate materials into both Spanish and Creole, as needed.
- Distributed 10 issues of an electronic newsletter about Everglades outreach activities.
- Held more than 35 public meetings or workshops for CERP and related topics.
- Distributed more than 60 news releases for CERP and related topics.
- Participated in at least 55 community events with staff, displays and materials. Bilingual staff members often were present.
- Updated the official CERP website with current information, including many of these public information products. Presentations are available in Spanish and Creole.

Other highlights from SFWMD and USACE for the reporting period are summarized below.

General Public Awareness. Many successful outreach efforts took place to raise awareness of and encourage involvement in the CERP. The official CERP website (www.evergladesplan.org) continued to provide an important source of current and archived news and information to the public and stakeholders about the CERP and was updated regularly. A toll-free line introduced in 2005 continued this reporting period. The line (1-877-CERP-USA) is recorded in English and Spanish, updated regularly with meetings and activities, and allows callers to leave a name to receive information in English or Spanish by mail. A network of CERP touch-screen kiosks expanded this reporting period. There were eight kiosks managed by the USACE in 2008. The presentation was updated, translated into Spanish, and a new exterior wrap was developed. The kiosks have been placed in public locations throughout south Florida, including a community college, science magnet school, and libraries. Screensavers were also developed.

An electronic newsletter, *CERP Report*, continued through 2007. An electronic newsletter about CERP news and projects, *Everglades Report*, was introduced in 2008, is distributed six times a year, and is available online. A new game for children and adults was introduced this reporting period: *Name That CERP Sound*. It features the sounds of birds and other animals of the Everglades. Fact sheets were produced on CERP projects and promotional items helped keep the CERP fun at community and other events.

The 2006 *CERP Report to the Public* was printed and distributed in early 2007 as well as being made available on the website. The 2007 *CERP Report to the Public* is currently in draft and should be available in print and out on the website later in 2008.

Ecosystem Restoration – with a focus on the Everglades – was the topic of one issue of the *Water Matters* newspaper insert produced quarterly by the SFWMD. This issue mirrored the project milestones in the executive summary of the annual *South Florida Environmental Report*. It was distributed in 1.5 million newspapers through the 16 counties.

A monthly Greater Everglades Ecosystem e-letter is also produced by the SFWMD and distributed electronically throughout the 16 counties and beyond. It also continues to be posted on the website. It covers project thresholds and events and usually includes dynamic video stream on a project in progress.

The SFWMD contributed photos and text on water management in south Florida and Everglades history and restoration for an interactive kiosk at the newly opened Palm Beach County Historical Society. Additional,

oversight and photography was provided for a new comprehensive Everglades exhibit at the South Florida Science Museum.

The SFWMD contracted with a film crew to produce *Everglades Restoration Update* segments that ran on local broadcast news stations (currently the CBS affiliate) on the lower west coast. These vignettes highlight components of Everglades restoration with an interviewer and engineer and/or scientist in the field. They are 3-5 minutes in length and have been very successful to provide filler for the evening news shows. In 2007, the SFWMD produced 13 stories that ran weekly for 3 months and then went to 13 stories over a 6-month period to run bi-monthly. The segments were repackaged into half-hour shows that provided education on the ferry ride from the west coast to the Florida Keys.

Minority Community Outreach. Special efforts continued to reach south Florida's [African American, Haitian, and Hispanic socio-economically impacted](#) residents with the CERP message. This included participating at community events with a display, materials, and team members; developing creative and culturally-sensitive public information products and programs; translating materials to Spanish and Creole; continuing an electronic newsletter and newspaper insert (*Community Outreach in Action*); producing television and radio programs; and holding special events (such as for Earth Day) in minority communities. The kiosks were placed in cities with high populations of minority residents, such as the Glades areas (Belle Glade, South Bay, and Pahokee) and Clewiston when possible.

In reaching out to the youth of the African American community, the USACE continued to produce "Living with the Waters," a comic strip series and workbook that teaches young readers lessons about how the Everglades figure in everyday life. New products included comic installments, an activity book, and a bookmark. For the Hispanic community, the kiosks were placed in areas with large Hispanic populations each September in observance of Hispanic Heritage Month, with an associated special event. For the Haitian community, a new event called Haitian Art Expressions was launched in 2006, the kiosk was placed in areas with larger Haitian populations in May (in connection with Haitian Flag Day), and the overview to the kiosk was translated into Creole. A print newsletter, *Community Outreach in Action*, continued to be published approximately two times a year, with a total of 150,000 of each issue delivered to minority communities via newspaper inserts and community groups.

Outreach was greatly expanded to the Lake Okeechobee area this reporting period. This was in response to a hurricane in 2005 and public interest in the rehabilitation of the Herbert Hoover Dike and CERP. Many of the residents who live and work around the lake are minority residents. Activities this reporting period for Lake Okeechobee communities included partnering with the Project HOPE organization in 2006 to organize community outreach activities; adding dedicated outreach staff members to visit local governments and communities regularly (one is fluent in Spanish); development of many print and online materials about the lake and dike; development of an online video about the lake and dike; holding a small business industry day in 2007; and placing comment card boxes in lake communities.

The SFWMD developed community coordination groups consisting of community colleges, community development corporations, ministerial alliances, elected officials, transportation representatives, workforce development, farm workers migrant programs, chambers of commerce, economic development councils, Florida Rural Economic Development Initiative (FREDDI), Florida Gulf Coast University, Education Center of Southwest Florida, and others. These groups helped to identify the local labor force, students for training, and small businesses that could participate in Everglades restoration work activities. The SFWMD also regularly informed these groups of project progress. Monthly one-on-one meetings were also held by the SFWMD with elected officials from the Glades area, and presentations were provided at city council and county commission meetings and other area meetings on a regular basis. Recruitment fairs were held by the SFWMD in Belle Glade, and door to door outreach was conducted to inform the community about CERP.

Environmental Education. The USACE continued with a very popular environmental education program this past reporting period. *The Journey of Wayne Drop to the Everglades* is a storybook for third to fifth graders about the Everglades ecosystem. An accompanying teacher's guide with lesson plans also was developed. The storybook was

first introduced in 2005, with widespread distribution to central and south Florida classes at that time. Since then, the USACE has continued the program on both the state and national level. The USACE has participated in state and national science teachers conferences for three years to raise awareness about the storybook and teacher's guide. During this reporting period the USACE distributed 44,000 student booklets in English. The storybook was also translated into Spanish and Creole, with 10,000 of each printed and distributed this reporting period. All products were placed online in a downloadable format. Associated promotional products were developed and distributed including fact sheets, a mobile, bulletin board characters, Wayne Drop squeeze figures, and rulers. In 2007, the remaining storybooks were distributed to private, charter, public, and home schools in central and south Florida, and to requestors nationally via an online request form. An online reading list also was developed of books of the Everglades in a searchable database.

The USACE held Earth Day events in 2007 and 2008 with elementary school students in south Florida creating more than 3,900 individual artworks on the Everglades. Associated special events were held in regional malls and movie theaters.

The SFWMD, in conjunction with the School Board of Palm Beach County and other partnering bodies, redeveloped curriculum for the Newspaper In Education (NIE) program for middle and high school students entitled: "Everglades: An American Treasure." This environmental educational material provides a history of the Everglades, educates students on goals of the CERP, and discusses current and future plans for restoring the ecosystem. The curriculum includes a student newspaper along with a teacher's guide that has Florida Comprehensive Assessment Test (FCAT) structured questioning and benchmark reading for seventh and ninth graders. It is distributed to more than 200,000 students throughout the 16-county region of the SFWMD.

As a complement to the NIE, the SFWMD also offers an Everglades Teacher Workshop where teachers are provided hands-on training on how to teach their students about the Everglades using this curriculum. The SFWMD offers one workshop per region on an annual basis where more than 100 teachers participate in these sessions.

An offset to the Everglades restoration stories produced for evening news segments (described above) is an interactive DVD developed for the classroom. The video segments have been repackaged into lessons highlighting the flora and fauna in the Everglades and the challenges faced when restoring this American treasure. Students provide the voice-over talent and questions have been added at the end of each lesson. These are distributed to teachers attending the NIE workshops. Approximately 150 copies have been distributed to schools with expanded stories and distribution in the works for next fiscal year.

Teacher workshops and curriculum was also being developed for the Loxahatchee Impounded Landscape Assessment (LILA) project for 7th and 9th graders. Two workshops will be conducted this fiscal year with plans to double this effort next year.

The SFWMD has also purchased five CERP kiosks strategically placed within the District's region to further showcase the goals, objectives, and progress on CERP.

Finally, the SFWMD partnered with the Urban League of Palm Beach County and Audubon of Florida to provide intern opportunities for at-risk youth from high school and college to work on Everglades related projects.

Small Business Outreach. Many efforts were made to reach south Florida's small and minority-owned businesses with information on how to participate in CERP. This included holding workshops, distributing printed materials, updating materials, participating in small business related conferences and fairs, and other efforts to ensure small business owners and representatives understand the separate federal and state contracting processes. In 2007, an industry day was held for the Herbert Hoover Dike Rehabilitation Project to increase awareness of the federal contracting process and opportunities for small businesses in the area. Lessons and concepts presented applied to other large programs around the lake, including the CERP.

The SFWMD participation approach consisted of identifying construction related businesses through business related groups, i.e. builders associations, economic development groups, and trade associations. The second approach was personal contact with small businesses in the area. Public meetings and construction symposiums were held for the public. The SFWMD developed a database and entered registered vendors into the database. Project managers were encouraged to break-up/divide large projects into smaller projects when possible to encourage small business participation at the prime level. Vendors were constantly notified of prime and subcontractor opportunities for Everglades restoration contracts. Vendors were also educated about the SFWMD procurement process, and the database of vendors was provided to prime contractors so they could identify potential subcontractors. In addition, a "Help Wanted" newsletter was created and distributed monthly to area businesses that contained information on upcoming projects and bids. The SFWMD enacted a new Small Business Enterprise (SBE) program which mandated that prime contractors utilize a set percentage of SBEs for subcontract activity.

As part of CERP's mission to reach out to socially and economically disadvantaged communities, the SFWMD ~~has~~ partnered with Palm Beach Community College, Education Center of Southwest Florida, and Miami Lakes Educational Center's Adult Education Division to develop and implement workforce development programs. Residents and contractors in areas where CERP projects will be built are-being/were trained in basic construction skills and heavy equipment operations to carry out expedited construction projects. In May 2006, 17 students from Belle Glade graduated from this training, making them the first class trained to work on an Everglades restoration project, the EAA A-1 Reservoir. Graduates received a certificate [Occupational Safety and Health Administration (OSHA) 10 certification, employability skills, small tool identification, site orientation, blue print reading, etc.] along with a uniform, hard hat, tools, and other accessories required for this trade.

Several symposiums have been hosted in local communities to increase their awareness, provide skill assessments, and promote workforce training. To date, the SFWMD has held six symposiums, with over 1,500 interested parties attending. They were held in LaBelle (Hendry County), Belle Glade and West Palm Beach (Palm Beach County), Okeechobee (Okeechobee County), Stuart (Martin County), and Ft. Myers (Lee County). Face-to-face meetings were also conducted with more than 600 individuals/businesses for potential partnership and participation in this workforce effort.

Project-Level Involvement. Many public meetings and workshops were held to inform and include the public in the development of CERP projects. This form of project-specific communication is essential to the success of the CERP. Meetings were announced in advance, held in convenient locations, and often featured an open house session to meet CERP staff prior to the formal meeting or workshop. For those people who could not attend meetings, all meeting documents were posted online. Comments were taken online, in addition to those taken in person at the meetings and workshops. Fact sheets were developed for individual CERP projects, with some translated into Spanish.

Since the launching of the accelerated projects initiative in 2004, the SFWMD has held numerous public workshops to encourage the exchange of ideas and information from stakeholders and the general public on the design phases of specific projects. Since 2004, four Construction Symposiums and thirteen WRAC Issues Workshops/Public Meetings have been held. These meetings and workshops are-were held in locations in close proximity to the projects in order to offer greater public and stakeholder attendance and participation. As the accelerated projects move from design into construction, the public has been ~~SFWMD has~~ invited the public to participate in groundbreaking ceremonies to share the accomplishments of 'turning dirt' on these projects. To date, 12 groundbreakings have been held for the accelerated projects.

Economic Benefits. The accelerated restoration projects have provided the south Florida economy with new job opportunities on various projects. For the EAA Reservoir Phase 1 Project, over 80 percent of the workforce hired is from the state of Florida, with over 52 percent coming directly from the Glades and Clewiston communities. Additionally, more than 80 percent of the goods and services have been provided from Florida companies, with 20 percent coming directly from the Glades community. Of the 310 current hourly project employees, 265 are from Florida: 124 are from the Glades area, 38 are from Clewiston, 84 are from within the SFWMD 16 counties, and 19

are from communities outside the 16 counties, but within Florida. Payroll wages of \$13,541,000 have been put directly back into Florida residents' household incomes. \$5,066,000 have gone to residents of the Glades area, \$4,276,000 to local residents within the SFWMD 16 counties within Florida, and 2,459,000 to Florida residents outside the 16 counties but within Florida.

In addition, the following expenditures were made for the referenced accelerated projects:

- Picayune Strand Restoration (Collier County region)
 - 28 local businesses
 - \$8,047,550 in expenditures to date (100%)
- C-43 Test Cells (Hendry County region)
 - 33 local businesses
 - \$10,000,000 in expenditures to date (100%)
 - 55 new jobs
- C-44 Test Cells (Martin/St. Lucie County region)
 - 42 local businesses
 - \$84,900,000 in expenditures to date (100%)
 - 20 new jobs
- Compartment B -- STA-2, Cell 4 (Palm Beach County)
 - 19 local businesses
 - \$19,419,909 in expenditures to date (100%)
 - 19 new jobs
- STA-5, Flow-Way 3 (Hendry County)
 - \$12,012,566 in expenditures to date (100%)
 - STA-6, Section 2 (Hendry County) \$22,433,986 expenditures to date (100%)

The Museum of Discovery and Science and the Task Force Collaboration Committee

The Museum of Discovery and Science (MODS) continued to serve as the interpretive site for Everglades restoration by educating south Florida's residents and visitors about the quality, quantity, timing, and distribution of water in the Everglades. During the reporting period, the *Florida Ecoscapes* exhibit was visited by over 450,000 visitors including 95,000 school children. Museum programming focused on a unique combination of engaging hands-on demonstrations, labs, and live animal encounters. These presentations were delivered at the museum and in the community. Additional Everglades programming was delivered during the museum's camp-ins, day camps, summer camps, and via school, public, and BECON television programs. An estimated 48,000 children from underserved areas were served through school and community visits and special programs targeting at-risk youth.

Through a collaborative initiative with the South Florida National Parks Trust and Florida Aquarium (Tampa), MODS held 10 training workshops for public school teachers and provided them with curriculum resources on how to bring Everglades education into the classroom. Separate Everglades courses were directed at children ~~ages~~ in grades K-3, ~~grades~~ grades 4-6, and ~~grades~~ grades 5-8. For the third consecutive year, the Florida Division of Forestry provided funding for MODS urban forestry internships that encouraged their interest in pursuing careers in environmental sciences and/or teaching. Five high school students worked in the program, giving over 350 informal presentations and tending the museum's backyard exhibit. Through collaboration with the University of Central Florida Media Convergence Laboratory, the museum ~~is~~ has started participating in a four-year National Science Foundation project that will merge virtual reality technology with museum exhibits to tell the Florida Water Story. ~~Many of the mixed reality portals will be installed in the EcoDiscovery Center expansion wing.~~

The ~~Museum's~~ MODS capital campaign to build the *EcoDiscovery Center* moved into high gear this year. Over \$14 million has been raised toward the \$20 million expansion project, which is scheduled for groundbreaking in 2011. To date, the museum has received four naming gifts of over \$1 million. Construction on the first phase of the project, the Bank of America Visitor Pavilion, began in March 2008.

Everglades Radio Network

The Everglades Radio Network (ERN) was the first FM version of a highway advisory radio station in Florida designed to educate and inform Florida’s residents and visitors about the expansive Everglades ecosystem. The network’s original programming highlights the natural wonders and environmental challenges facing the restoration of the Greater Everglades Ecosystem, as well as profiles of individuals and organizations associated with the region.

Serving as a vital link to more than 18,000 motorists daily, ERN also enhances highway and public safety by airing emergency weather bulletins, travel advisories, and Amber Alerts along Alligator Alley, the reversible hurricane evacuation route linking southwest and southeast Florida. Broadcast from Florida Gulf Coast University, the magazine-style continuous broadcast from WFLP-LP or WFLU-LP (FM 98.7 or 107.9) features details about the Everglades ecosystem, its wildlife and habitat, along with a history of the Everglades and the natural and man-made forces affecting its future. All of ERN’s segments are also available over the Internet at www.evergladesradionetwork.org. The website links to the live streaming broadcast or individual segments in MP3 format, which are available to be downloaded for educational purposes.

Subgoal 3-B: Maintain or improve flood protection in a manner compatible with ecosystem restoration

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

At the end of the reporting period, one project contributing to objective 3-B.1 is ongoing and one is underway.

Biennial Report Table 20 – Flood Protection

3-B.1 Table reflects June 2008 Status of the Projects to Maintain or Improve Existing Levels of Flood Protection for the urban, agricultural, and natural environments				
Project ID	Project Endpoint	Project Name	Output	Status
3600	2013	C-4 Flood Mitigation Projects	Flood protection at 1 in 10-year level	Ongoing
1300	2010	C&SF: C-111 (South Dade)	Flood protection at 1 in 10-year level	Underway

C-4 Basin Flood Mitigation Project

The project was under construction during the reporting period and is scheduled to be completed in March 2011. The C-4 Emergency Detention Basin Phase 1 and the C-4 Emergency Detention Phase 2 were completed and operational as of 2006. Phase 3 involved the selective dredging of the C-4 to improve conveyance capacity at SW 132nd Avenue and the Florida Turnpike. This project was completed in June 2007. A gravity wall (flood wall) will be constructed in three segments along the north bank of the C-4 Canal from: 132nd Avenue to the Florida Turnpike; SW 107th Avenue to SW 97th Avenue; and from SW 97th Avenue to the Palmetto Expressway. A portion of the first segment is in the solicitation process and the contract is expected to be awarded in June 2008. The remaining segments will proceed upon obtaining sufficient construction easements and with the availability of funds.

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

At the end of the reporting period, the project contributing to objective 3-B.2 is ongoing.

Biennial Report Table 21 - Herbert Hoover Dike

3-B.2 Table reflects June 2008 Status of the Project to Provide Adequate Levels of Flood Protection to the Communities and Lands Surrounding Lake Okeechobee				
Project ID	Project Endpoint	Project Name	Output	Status
3700	2025	Herbert Hoover Dike Rehabilitation		Ongoing

Herbert Hoover Dike Rehabilitation

The Herbert Hoover Dike (HHD) system consists of approximately 143 miles of levee surrounding Lake Okeechobee with 19 culverts, hurricane gates, and other water control structures. The first embankments around Lake Okeechobee were constructed by local interests from sand and muck, circa 1915. Hurricane tides overtopped the original embankments in 1926 and 1928 causing over 3,000 deaths. The River and Harbor Act of 1930 authorized the construction of 67.8 miles of levee along the south shore of the lake and 15.7 miles of levee along the north shore. The USACE constructed the levees between 1932 and 1938 with crest heights ranging from +32 to +35 feet, NGVD.

A major hurricane in 1947 prompted the need for additional flood protection work. As a result, Congress passed the Flood Control Act of 1948 authorizing the first phase of the C&SF Project. By the late 1960's the new dike system was completed, raising the elevation of the levees to +41 feet, NGVD. This provides protection to the Standard Project Flood level, approximately an event occurring once in 935 years.

However, investigations conducted in the 1980's and early 1990's of the dike system's potential seepage and stability problems resulted in the identification of two major areas of concern: the seepage and embankment stability at the culvert locations, and the problematic foundation conditions of the dike. During high water events piping is experienced through the levee. In 1999, the USACE developed a plan to rehabilitate the HHD and the plan was approved in 2000. This rehabilitation work covers the entire dike. The areas of work are defined as Reaches 1 – 8, with Reach 1 further divided into four sub-reaches, A through D.

Currently the project is broken into three phases: (1) completion of the Major Rehabilitation Report (MRR) for Reaches 2 and 3, (2) design of land side rehabilitation within Reach 1, and (3) construction of a cut-off wall in Reach 1.

The MRR includes looking at a system of alternatives to rehabilitation in Reaches 2 and 3 of HHD while performing a risk assessment that focuses on geotechnical, structural, and loss of life as the basis for the report. The Draft MRR is expected to be completed in March 2009 with a Final MRR expected in December 2009.

Design continues on sub-reaches 1A, B, C, and D of the land side rehabilitations. Design alternatives range from construction of seepage berms, installation of relief wells, filling of perimeter toe ditch, or a combination of features. The Reach 1 land side design is being completed by USACE Jacksonville District staff, dam safety experts from other USACE Districts, as well as USACE contractors. All land side design work is being reviewed by independent technical review teams as well as USACE dam safety experts. All landside design work in Reach 1A is scheduled to be completed by May 2009.

Cut-off wall installation began in sub-reach 1A and is being completed by a combination of three under a Multiple Award Task Order Contract (MATOC) vehicle throughout all of Reach 1. The cut-off wall is being installed about

60-feet below the crest of HHD with installation depth dependant on the geology of the Reach. Cut-off wall installation is scheduled to be completed in Reach 1 by 2011.

Subgoal 3-C: Provide sufficient water resources for built and natural systems

Objective 3-C.1: Plan for regional water supply needs¹⁴

At the end of reporting period updates of the four regional water supply plans within the South Florida Ecosystem that contribute to objective 3-C.1 were all underway and nearing completion.

Biennial Report Table 22 – Regional Water Supply

3-C.1 Table reflects June 2008 Status of the Regional Water Supply Plans				
Project ID	Project Endpoint	Project Name	Output (plans)	Status
3800	2008	Regional Water Supply Plans (Formerly Project ID 3704)	Plan	Underway

Regional Water Supply Plans

Updates of the Upper East Coast and Lower West Coast Water Supply Plans were approved in July 2006. The Kissimmee Basin Water Supply Plan Update was approved in December 2006 and the Lower East Coast Water Supply Plan Update was approved in February 2007. The updated plans ~~will~~ reflect the Water Resource Protection and Sustainability Program, created by Senate Bills 444 and 332 and enacted in the 2005 state legislative session. The Water Resource Protection and Sustainability Program requires a higher level of water supply planning and coordination between the water management districts and local governments and ensures that permitted water supply and potable water facilities are available before new development is approved.

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

At the end of the reporting period, the projects contributing to objective 3-C.2 are on hold.

Biennial Report Table 23 – Water Reuse

3-C.2 Table reflects June 2008 Status of the Projects to Increase Volumes of Reuse on a Regional Basis				
Project ID	Project Endpoint	Project Name	Output (mgd)	Status
3900	2023	C&SF: CERP - South Miami-Dade County Reuse (CERP Project WBS #98) (CERP Project # WBS 98)(Formerly Project ID 3800)	131	
3901	2023	C&SF:CERP - West Miami-Dade County Reuse (CERP Project WBS# 97) (CERP Project # WBS 98)(Formerly Project ID 3800)	100	
3902	2016	C&SF: CERP Wastewater Reuse Technology Pilot Project (Formerly Project ID 3802) (CERP Project WBS# 37)		

¹⁴ The legal authority and requirements for water supply planning are included in Chapters 373, 403, and 187 Florida Statutes. During the State of Florida’s 2005 legislative session, lawmakers revised state water law. This has led to the SFWMD reporting increased water supply in Objective 3-C.2 in the alternative water supply program and deleting Objective 3-C.1 as a measurable output of increased water. The regional water supply plans are still being done but the increased supply is being funded through the Alternative Water Supply Development Program.

Wastewater Reuse Technology Pilot

The Technology Pilot Project as originally identified in the CERP has been on hold since 2004. The PMP was approved in November 2003 and part of the initial PIR efforts (e.g. site-selection, the development of a Technology Report to evaluate various treatment alternatives, the performance of these alternatives in obtaining the desired water quality to be discharged to a pristine environment, and the capital and operating costs associated with these technologies for full-scale implementation and the monitoring and evaluation of the presence of micro-contaminants in the existing wastewater treatment facility in South Miami-Dade County), were completed at the time that the project was put on hold.

Water reuse will be implemented in Miami-Dade County over the next 20 years. A 20-year consumptive use permit was issued for the Miami-Dade Water & Sewer Department in 2007. This permit incorporates 170 mgd of reuse projects. Potential projects include ground water recharge, environmental enhancement, and irrigation. The permit includes development and construction of a Technology Pilot Project.

To advance water reuse in southeast Florida, the SFWMD, in cooperation with the cities of Sunrise and Plantation, conducted advanced wastewater treatment pilot studies to evaluate the alternative of reusing highly treated reclaimed water for ground water replenishment via canal discharge and infiltration trenches in 2007. The pilot studies investigated the performance of different physical-chemical and biological advanced waste, including removal of micro-constituents, and modeling the fate, transport and impact of discharged reclaimed water, and evaluated the toxicity of reclaimed water discharged into natural water bodies.

The volume of wastewater that was treated and reused in the SFWMD has almost doubled over the last 10 years to 229 MGD. Reclaimed water is being reused for irrigation of residential lots, golf courses, and other green space, ground water recharge, industrial uses, and environmental enhancement.

Biennial Report Table 24 SFWMD Water Reuse, 2006

Region	Wastewater Treated (mgd)	Water Reused (mgd)	% of Wastewater Reused
Lower East Coast	650	67	10%
Lower West Coast	83	69	83%
Upper East Coast	19	11	58%
Kissimmee Basin	82	82	100%
TOTALS	834	229	27%

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

At the end of the reporting period, the project contributing to objective 3-C.3 was underway and ongoing.

Biennial Report Table 25 – Alternative Water Supplies

3-C.3 Table reflects April 2008 Status of the Project to Increase Water Made Available through the State’s Water Protection and Sustainability Program and the SFWMD Alternative Water Supply Program				
Project ID	Project Endpoint	Project Name	Output (mgd)	Status
4000	TBD	Alternative Water Supply Grant Program (Formerly Project ID 3900)	172	Ongoing

Alternative Water Supply Grant Program

The Alternative Water Supply (AWS) Development Program awards grants to local water providers to develop additional water supply through alternative technologies.

In 2005, the Florida Legislature revised state law and created the Water Protection and Sustainability Program, which established recurring funds and is administered through the SFWMD’s Alternative Water Supply Funding Program specifically for cost-sharing AWS project construction costs. The new legislation defined AWS projects as: saltwater and brackish water projects; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity; reclaimed water; stormwater (for use by a consumptive use permittee); and any other source designated as nontraditional in a regional water supply plan.

The annual targets and the actual alternative water supplies for each region are listed in Biennial Report Table 24. The 2007 achievements were lower than the annual water targets by 4.83 mgd. The 2007 targets were based on the estimated water made available in the applications received. The Alternative Water Supply Program recommended that 55 projects receive funding for fiscal year 2007. The FY2007 budget included \$36 million in AWS funding for local government and other partners of which \$18 million was provided by the State for 55 water supply projects as part of the Alternative Water Supply Funding Program.

Biennial Report Table 26 – SFWMD Alternative Water Supply Program Achievements, 2007

Region	2007 Targets (mgd)	2007 Achievements (mgd)
Lower East Coast	22.30	20.30
Lower West Coast	7.70	3.70
Upper East Coast	2.33	5.50
Kissimmee Basin	3.15	1.15
TOTALS	35.48	30.65

MEASURING PROGRESS TOWARD RESTORATION

The Task Force requested that the SCG develop a small set of System-wide Indicators (Table 27) that will help them understand in the broadest terms how the ecosystem, and key components, are responding to [the implementation of restoration projects, initiatives and management activities](#). [In response to this request, a suite of System-wide Indicators was developed in an open and transparent process, independently reviewed and identified in the 2006 Strategy and Biennial Report. The indicators are organized into ecological and compatibility categories. Since 2006 the SCG, in close cooperation with RECOVER and the broader community of indicator scientists, coordinated a common format for assessing and communicating the scientific aspects of the ecological indicators. This is the first year that the Biennial Report will include the status of the ecological indicators. Metrics and targets for the compatibility indicators are being developed, tested, and vetted. As additional years are added to the biennial indicator report, additional columns of stoplights will be added to the stoplight tables and will provide a framework for seeing trends in restoration for each indicator. The biennial stoplight reports are linked to the detailed information contained in the report entitled, *System-wide Indicators for Everglades Restoration 2008 Assessment* \(Doren et al. 2008a\).](#)

The CERP and RECOVER programs are and will be monitoring many additional aspects of the ecosystem including such things as; rare and endangered species, mercury, water levels, water flows, storm-water releases, dissolved oxygen, soil accretion and loss, phosphorus concentrations in soil and water, algal blooms in Lake Okeechobee, hydrologic sheet flow, increased spatial extent of flooded areas through land purchases, percent of landscape inundated, tree islands, salinity, and many more. The set of indicators included here are a sub-set from a larger monitoring and assessment program and they are intended to provide a system-wide, big-picture appraisal of restoration. Many additional indicators have been established that provide a broader array of parameters. Some of these are intended to evaluate sub-regional elements of the ecosystem (e.g. individual habitat types) and others are designed to evaluate individual CERP projects (e.g. water treatment areas). This combination of indicators will afford managers information for adjusting restoration activities at both large and small scales. [This suite of System-wide Indicators was developed specifically to provide a top-of-the-mountain-view of restoration for the Task Force and Congress.](#) The approach used to select these indicators focused on individual indicators that integrate numerous physical, biological, and ecological properties, scales, processes, and interactions to try to capture that sweeping mountain-top-view. Identifying a limited number of focal conservation targets and their key ecological attributes improves the successful use and interpretation of ecological information for managers and policy makers and enhances decision-making.

A goal has been to develop a suite of indicators composed of an elegant-few (Table ~~XX~~27) that would achieve a balance among; feasibility of collecting information, sufficient and suitable information to accurately assess ecological conditions, and communicating the information in an effective, credible, and persuasive manner to decision makers. For the purposes of this set of indicators, system-wide is characterized by the both physiographic and ecological elements that include: the boundary of the SFWMD and assessment modules, and the ecological links among key organisms.

In addition, these indicators will help evaluate the ecological changes resulting from the implementation of the restoration projects and provide information and context by which to adapt and improve, add, replace or remove indicators as new scientific information and findings become available. Indicator response will also help determine appropriate system operations necessary to attain structural and functional goals for multiple habitat types among varying components of the Everglades system.

Using a suite of System-wide Indicators (Table 27) to present highly aggregated ecological information requires indicators that cover the spatial and temporal scales and features of the ecosystem they are intended to represent and characterize. While individual indicators can help adaptively manage at the local scale or for particular restoration projects, collectively indicators can help assess restoration at the system scale.

Stoplight-Key Findings Report Cards

The integrated summary is presented in a 2-page format using colored traffic light symbols that have a message that is instantly recognizable, easy to comprehend, has appropriate cultural associations for the responses needed in each case, and is universally understood. This stoplight restoration report card provides a uniform and harmonious method of rolling-up the science into an uncomplicated synthesis. This report card effectively evaluates and presents indicator data to managers, policy makers, and the public in a format that is easily understood, provides information-rich visual elements, and is uniform to help standardize assessments among the indicators in order to provide more of an “apples to apples” comparison that managers and policy-makers seem to prefer.

The 2008 Assessment of the suite of System-wide Indicators includes a 2-page stoplight/key summary report card for each indicator summarizing the status of the indicators, a more detailed set of science reports on the status of

Biennial Report Table 27 – Task Force System-wide Indicators for 2008
<i>Ecological Indicators</i>
<ul style="list-style-type: none"> • Fish and Macroinvertebrates • Wading Birds (White Ibis, Wood Stork) • Wading Birds (Roseate Spoonbill) • Florida Bay Submerged Aquatic Vegetation • Florida Bay Algal Blooms • Crocodylians (American Alligators and Crocodiles) • American Oysters • Periphyton and Epiphyton • Juvenile Pink Shrimp • Lake Okeechobee Littoral Zone • Invasive Exotic Species
<i>Compatibility Indicators</i>
<ul style="list-style-type: none"> • Water Volume • Biscayne Aquifer Saltwater Intrusion • Flood Protection – C-111 Basin

each indicator, and a summary synthesis that evaluates the collective information of the suite of indicators. For more detailed information on these indicators please also refer to the [report entitled, *System-wide Indicators for Everglades Restoration 2008 Assessment \(Doren et al. 2008a\)* available online at \[www.sfrestore.org\]\(http://www.sfrestore.org\). This report contains summary information for each of the system-wide indicators and a synthesis of the indicators collectively. This report was independently reviewed by a panel of scientists including: \[Dr. Jeffrey Jordan\]\(#\), \[Dr. Donald Kent\]\(#\), \[Dr. JoAnn Burkholder\]\(#\), \[Dr. Joanna Burger\]\(#\), and \[Dr. Robert Ward\]\(#\). Additional information on the individual indicators, their development and application is available in the peer reviewed journal; \[Ecological Indicators Special Issue – Indicators for Everglades Restoration \\(See Doren et al. \\(eds.\\) 2008b\\) \\(In Press\\) \\(2008\\)\]\(#\).](#)

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 merits attention.



Green - Situation is good and restoration goals or trends have been reached. Continuation of management and monitoring effort is essential to maintain and be able to assess “green” status.

Fish and Macroinvertebrates

KEY FINDINGS



SUMMARY FINDING:

Shark River Slough and Taylor Slough monitoring sites did not meet restoration targets (red) because of drier conditions than expected based on rainfall. These conditions resulted in more Everglades crayfish (*Procambarus alleni*, which prefers drier conditions), and fewer fish than expected. Water management is causing drier conditions in these areas than would be expected based on the amount of rainfall and water depth patterns in our baseline hydrological period (baseline) of 1993 through 1999. Results were mixed in Water Conservation Areas (WCA) 3A and 3B, where there was a greater deal of variation between long and short hydroperiod regions than would be expected from observed rainfall. Water management has caused a re-distribution of fish in these areas, though it is not currently possible to determine if the net effect is more or fewer fish. This long-term monitoring program indicates that the current hydrological impacts have existed since 2002, and possibly since 2001. Monitoring data indicate that non-native taxa are most common at edge habitats, though widespread in Everglades marshes. There was no evidence of changes in the relative abundance of non-native taxa at our monitoring sites between 2000 and present.

KEY FINDINGS:

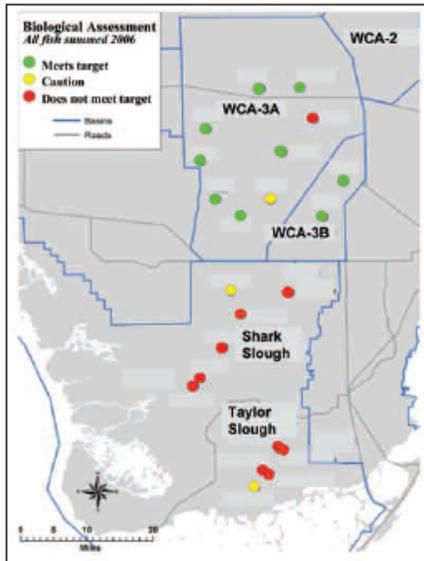


Figure 1. The target hydrological years for this assessment include 1993-1999. Forecasting models (statistical models derived by cross-validation methodology) that link regional rainfall to surface water-depth at our monitoring sites were used to model hydrology. Alternative hydrological model outputs, such as those derived by the Natural System Model, generally yield longer hydroperiods than used here leading to more impacts.

1. All of the sites coded red for fish density resulted from fewer fish than expected based on observed rainfall, and most are in Everglades National Park.
2. Of the 3 long-term monitoring sites coded yellow, 1 was for greater fish density than expected and two for less. The lone site with more fish was in WCA 3A.
3. Everglades crayfish and one species of fish, which both prefer short-hydroperiod conditions were more abundant in Taylor Slough than expected, as well as in some parts of Shark River Slough.
4. Results were mixed in WCA 3A. There was evidence of more frequent drying than expected from observed rainfall in the western area. There were more fish than expected in the southeastern corner of WCA 3A, possibly because fish moved into this section of 3A when western portions of the area dried. Everglades crayfish were infrequently collected in WCA 3A in the hydrological baseline period and afterwards.
5. There were no systematic deviations from rainfall-based expectations in WCA 3B for all fish summed. Flagfish and eastern mosquitofish indicated a potential impact from drier conditions than baseline. Everglades crayfish were infrequently collected in WCA 3A in the baseline period and afterwards.
6. 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. Plans to increase ecosystem connectivity may increase dispersion of such taxa and should be monitored.

Fish and Macroinvertebrates

STOPLIGHTS

Performance Measure	Current status	Current Status
Shark River Slough		
eastern mosquitofish		Fewer than expected because of regional drying
flagfish		Two of 18 plots with more than expected
bluefin killifish		Fewer than expected because of local and regional drying
total fish		Fewer than expected because of local and regional drying
Everglades crayfish		More than expected because hydroperiod was shorter than expected
Non-native fishes		Present at all monitoring sites. None more than 2% of all fish collected; numbers highest at mangrove boundary
Taylor Slough		
eastern mosquitofish		Fewer than expected because of local and regional drying
flagfish		No assessment; model did not converge
bluefin killifish		Fewer than expected because of local and regional drying
total fish		Fewer than expected because of local and regional drying
Everglades crayfish		More than expected because hydroperiod was shorter than expected
Non-native fishes		Present at all monitoring sites. None more than 2% of all fish collected; numbers highest at mangrove boundary
Water Conservation Area 3A		
eastern mosquitofish		7 of 27 plots with more than expected because of regional drying
flagfish		More than expected at sites affected by regional drying
bluefin killifish		Fewer than expected because of local and regional drying
total fish		
Non-native fishes		Present at all monitoring sites. All less than 2% of total and fewer than in Everglades National Park
Water Conservation Area 3B		
eastern mosquitofish		More than expected because of regional drying
flagfish		More than expected because of regional drying
bluefin killifish		No deviations from expectations.
total fish		No deviations from expectations.
Non-native fishes		Present at all monitoring sites. All less than 2% of total and fewer than in Everglades National Park

Wading Birds (Wood Stork, White Ibis)

KEY FINDINGS



SUMMARY FINDING:

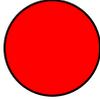
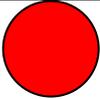
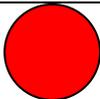
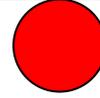
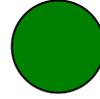
Conditions for nesting were suboptimal for wading birds in 2007, with poor conditions for production of prey preceding the nesting season, and dry to very dry conditions prevailing during much of the nesting season. Annual conditions are notoriously variable, however, and a longer term view of trends is important when evaluating wading bird responses. Three of the four indicators are well below thresholds for restoration – timing of stork nesting, proportion of all nesting taking place in the coastal ecotone, and ratio of ibis/stork nests to Great Egret nests. However, each of these indicators has shown some degree of improvement over the past ten years. The interval between exceptionally large ibis nesting events has improved markedly, however, and is now well in the range of restored conditions, though none of the large nestings has occurred in the ecotone region. Taken together, these indicators suggest only slight progress towards desired restoration goals, though the trend appears to be positive.

KEY FINDINGS:

1. Dry to very dry nesting conditions were exhibited in 2007, preceded by low water levels. This created poor conditions for the production and availability of prey animals throughout the system. Numbers of breeding wading birds were considerably reduced in 2007 by comparison with recent averages, and nest success was poor to very poor in nearly all locations. However, recent research has linked food availability, body condition of adults, and nest initiation and success, which is a crucial step in understanding and managing populations of these birds.
2. Wood Storks did not nest at many locations and initiated nesting late (February) by historical standards where they did nest. Over the past decade there is some indication of earlier breeding (January and December), providing weak evidence of an improving trend. Thresholds for recovery are running five year means corresponding to initiation dates earlier than December 30.
3. The proportion of nesting birds occurring in the headwaters/ecotone was only 7%, far below restoration goals. This suggests that conditions in the coastal zone have not improved appreciably for nesting wading birds. Larger freshwater flows are likely to create conditions more conducive to nesting in the estuarine zone. Over the past ten years there is evidence of an increasing trend in the proportion of birds nesting in the headwaters. Restored conditions are expected to generate greater than 70 percent of nesting in the ecotone.
4. The ratio of ibis+stork nests to Great Egret nests (4:1) is still far below the 30:1 characteristic of pre-drainage conditions. Over the ten year period, there has been considerable improvement in this ratio, suggesting that the system may be becoming more attractive to shallow water tactile foragers, and less so to deep water sight foragers.
5. 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. Recent research strongly supports the hypothesis that the change is due to increased production and availability of prey to ibises. All of the large nestings, however, have been in freshwater areas, and not in the estuarine headwaters. Restored conditions are expected to generate a mean interval of 2.8 years or less between large ibis nestings – that condition has been met.

Wading Birds (Wood Stork, White Ibis)

STOPLIGHTS

PERFORMANCE MEASURE	CURRENT STATUS ^a	CURRENT STATUS ^a
Wading bird Indicator Summary		Three out of the four Wading Bird Indicators are Red based on the most current data available. Overall, wading bird populations and indicators are well below recovery goals.
Ratio of Wood Stork + White Ibis nests to Great Egret nests		Current ratio is well below 30:1 considered representative of healthy nesting conditions.
Month of Wood Stork nest initiation		2007 initiation was in February, and mean initiation dates in past five years are well below the recovery goal of November or December.
Proportion of nesting in headwaters		Proportion nesting in the headwaters was 7% in 2007, and average proportions in last five years remain well below yellow or green thresholds.
Mean interval between exceptional ibis nesting years		This interval is now very close to the target for restoration, and has shown dramatic improvement in last decade.

^aData in the Current Status column for the wading bird indicator reflect data inclusive of calendar year 2007.

Wading Birds (Roseate Spoonbill)

KEY FINDINGS



SUMMARY FINDING:

Roseate Spoonbill nesting results in Florida Bay indicate that conditions in Florida Bay and Taylor Slough are still unable to support colonies with target numbers of spoonbills bay-wide. The colonies in the northwestern portion of the bay seem to be doing well and have been stable both in numbers and nest success for the last ten years, however, the total numbers there are relatively small and numbers bay-wide are still not meeting targets. Northeastern bay colonies are in serious decline. Although the spoonbill population remained stable overall in 2007, there was no sign of any recovery toward targets. It appears that restoration actions to date have had no ecologically significant effects for the southern estuaries. We expect the spoonbill performance measures may begin to improve after proposed changes in the Modified Water Deliveries Program (MOD Waters) and C-111 Spreader Canal Phase 1 are completed. However, unless we experience some very wet years in the mean time, we can expect no improvement in these performance measures until these management changes occur.

KEY FINDINGS:

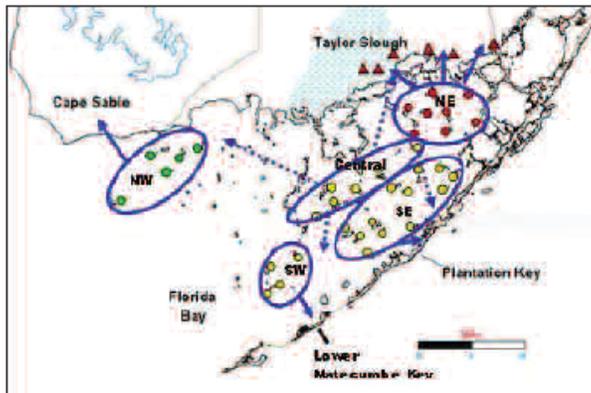


Figure 1. Location of all known spoonbill nesting colonies within Florida Bay (circles) and prey fish sampling sites in the Taylor Slough and C-111 Basin foraging grounds (triangles). Colonies are grouped into five regions of the bay based on important foraging grounds for the colonies. Arrows from each region indicate the primary foraging ground. Colors of colonies and prey sampling sites are based on stoplight scores for various performance measures.

1. Northeastern Florida Bay is in need of immediate action in order to keep spoonbill numbers from continuing to decline. The threshold of at least 1 chick per nest was not met in 2007 and was therefore considered a failed year. The NW Florida Bay colonies produced 1.6 chicks per nest, well above the target, suggesting that the NE colonies probably failed due to water management influences in Taylor Slough. The number of nests in the NE bay remained very low in 2007 with only 106 nests of the target of 625 nests in this region.
2. Taylor Slough and the C-111 basin remain less productive than under historic conditions based on prey fish data.
3. There were 459 nests bay-wide in 2007. This was well below the target of 1250 nests. However, the bay-wide numbers are stable.
4. Number of nests and nest production continue to exceed targets in northwestern Florida Bay. Data suggest this is probably because this area is less affected by water management and provides a more stable habitat condition.
5. The NE Florida Bay colonies forage in estuaries reliant on water from Taylor Slough (see Figure 1). Their continued failure to meet restoration targets indicates that water timing, quantity and distribution in Taylor Slough and NE Florida Bay are not meeting criteria necessary for proper estuary function in these locations.

Wading Birds (Roseate Spoonbill)

STOPLIGHTS

Performance Measure	CURRENT STATUS ^a	CURRENT STATUS ^a
NORTHEASTERN FLORIDA BAY AND THE SOUTHWESTERN ESTUARIES		
Number of successful nesting years out of the last 10 in NE FL Bay		In NEFB, only two of the last 10 years have been successful at >1.0 c/n. Current conditions are well below restoration targets
Chick Production Comparison of NE to NW (5 Yr Mean)^d		The five year mean of NE production was less than half that of the NW. Lack of sufficient freshwater flows into Taylor South continue to negatively affect spoonbill nesting in NEFB.
Number of nests in FL Bay (5 yr mean)		The target number of nests for the whole bay is 1250. The 5 year mean number of nests was 474 or 38% of target. This indicates that the FL Bay spoonbill population is not recovering.
Number of nests in N.E. FL Bay (5 Yr mean)		The target number of nests is 625. The 5 year mean number of nests was 109 nests or 18% of target, indicating that the NEFB spoonbill population is in jeopardy.
Number of Nests in SW FL Bay		No data are being collected in the SW estuaries.
Prey Community Structure		Prey fishes classified as freshwater species made up less than 1% of the total catch at the sampled spoonbill foraging sites in NEFB. The Target is 40% suggesting that the prey base for nesting spoonbills remains very low.
NORTHWEST FLORIDA BAY		
Chick Production in NW FL Bay		This performance measure indicates that 1.25 c/n in NW FL Bay is being maintained. In 2007, the NW colonies produced 1.7c/n; well above the target.
Number of nests in NW FL Bay (5 Yr Mean)		The target for the number of nests in NW Florida Bay is 200. The average number of nests for the last five years was 241 exceeding the target
Percent successful years in NW FL Bay		In the NW FL Bay spoonbills have been successful 8 of the last 10 years. The mean for the last 5 years has been 66% successful .

^aData in the Current Status column reflect data collected in the 2006-2007 nesting cycle

○ = No data are available for these areas due to lack of monitoring.

Florida Bay Submerged Aquatic Vegetation

KEY FINDINGS



SUMMARY FINDING:

Most indicators show good Submerged Aquatic Vegetation (SAV) Abundance Indexes in 2007 improving against 2006 and the 10-year trend with exceptions in the Central Zone and the Southern Zone. The Target Species index in the Transition Zone is poor, reflecting the absence of *Ruppia* in 2006-7 while other zones show increased diversity. Combined index scores (Fig. 1) show fair status in Transition, Central and Southern Zones, Good in the Northeast and Western Zones.

KEY FINDINGS:

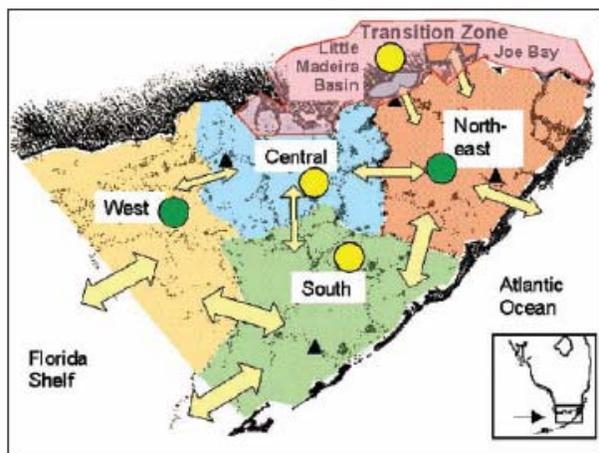


Figure 1. Map of SAV Indicator Zones with current status indicators combining Abundance and Species Indexes.

1. The Abundance Indicator (spatial coverage and average density) is in generally good condition or improving except in the Central and Southern Zones. These zones had previously exhibited loss of SAV through die-off and then became sites of recurring algal blooms. The Northeast Zone metric has declined during a two-year bloom, though slightly above the “good” threshold.
2. The Target Species indices (species diversity and presence of specific target species) are considered more variable and less predictable than the Abundance index. Nonetheless, the Transition Zone has shown clear decline in the *Ruppia* target species over the past two years. Northeast, Southern and Transition Zones have shown some improvement in this indicator due to increased *Halodule* presence.
3. Indicator criteria for both Abundance and Diversity are zone-specific. The Northeastern Zone has generally low SAV density but high coverage and species diversity of *Thalassia*, *Halodule* and *Ruppia*. The Transition Zone has mixed populations of *Thalassia* - *Halodule* and *Ruppia* - macroalgae. The Southern Zone has high occurrence of monospecific *Thalassia* stands while *Thalassia* and *Halodule* co-occur in the Central Zone. The Western Zone is productive with dense, diverse stands of *Thalassia*, *Syringodium*, and *Halodule* in some basins.
4. As freshwater is introduced, *Ruppia* will continue expansion and other species may decline in the Transition Zone, Northeast Bay and the Central Bay in response to lower salinity. Transition bays Long Sound, Joe Bay, Little Madeira Bay, McCormick Creek are expected decline in *Thalassia* as low-salinity species increase, resulting in a more diverse, stable SAV habitat. Reducing hypersalinity and abrupt changes in salinity in Florida Bay, especially in the Transition Zone, Central Bay and Northeast Bay, will assist in preventing development of monospecific stands of *Thalassia*. Conditions that exclude multiple SAV species and reduce species diversity lead to poorer habitat quality and greater potential for seagrass loss.
5. Determination of sources of algal blooms will aid in developing plans to reduce blooms and their impact on SAV.
6. Determination of sources of algal blooms will aid in developing plans to reduce blooms and their impact on SAV.

Florida Bay Submerged Aquatic Vegetation

STOPLIGHTS

Zone/Performance Measure	Current Status ^a	Current Status ^a
Northeast		
Abundance		Abundance is good in all basins monitored in the NE with a composite scores of 0.81 (max=1) for extent and density of SAV.
Target Species		A score of 0.81 (good) is measured for current (2007) species evenness and presence of subdominants <i>Halodule</i> and <i>Ruppia</i> , up from 0.63 in 2006.
Transition Zone		
Abundance		Highest scores for abundance are found in basins in the Transition Zone, increasing from 0.83 to 0.91 in 2006-7.
Target Species		Generally good species evenness in 2006 was reduced in 2007 due to dominance by either <i>Thalassia</i> or <i>Halodule</i> in areas and reduced co-occurrence of the two. Evenness scores are offset by lack of target <i>Ruppia</i> in this zone.
Central		
Abundance		Abundance in Central basins were marked by low scores throughout, based mostly on low density, trending lower in several basins in this zone in recent years. Spatial coverage was generally very good.
Target Species		Increasing presence of secondary target species (<i>Halodule</i>) has improved in this region though a slight reduction in species evenness was noted.
South		
Abundance		The Southern region shows high spatial extent (0.88) but a low score for the SAV density index (avg. 0.34) with slight decline into the yellow criterion in one basin.
Target Species		In the Southern region basins measured, <i>Thalassia</i> dominance is reflected in a poor though improving diversity score (0.25).
West		
Abundance		Western Zone basins are marked by high abundance scores (1.0) for both extent and density.
Target Species		Although on average, the zone has very high scores for diversity (0.75), one area has shown losses in diversity and presence of target species in 2006.

^a2007 data; all zones for which calculations are made are based on 10 year datasets

Florida Bay Algal Blooms

KEY FINDINGS

SUMMARY FINDING:

Re-suspension of nutrients from the 2005 hurricane season resulted in algal blooms in many regions of the southern estuaries and may cause continued algal blooms in the bay for some time. However, this is expected to subside within a few additional years in lieu of further significant hurricane activity and if water flows to the southern estuaries are improved should return to predominantly green for all regions with the possible exception of Barnes Sound and Manatee Bay. If water flows do not improve the areas will probably remain yellow.

KEY FINDINGS:

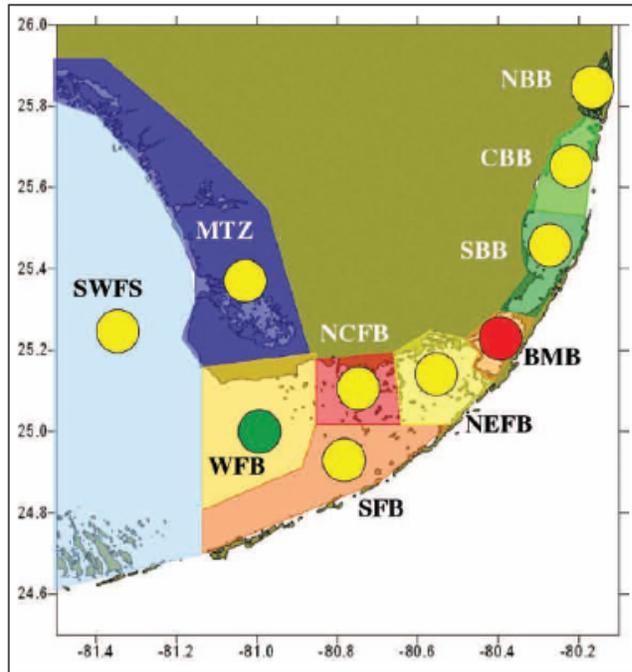
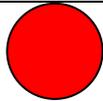
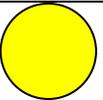
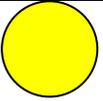
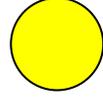
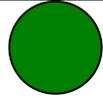
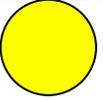
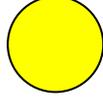
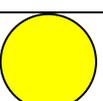
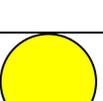
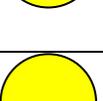


Figure 1. Map of Florida Bay regions with stoplight ratings by region.

1. The majority of regions assessed had significant algal bloom activity that appears to have been predominantly influenced by the heavy 2005 hurricane season aggravated for the eastern bay by road construction on US 1.
2. The majority of regions assessed had chlorophyll-*a* and algal blooms rated as moderate (yellow).
3. The majority of regions assessed where the chlorophyll-*a* was higher than the median do not appear to be indicative of long-term negative trends.
4. The most commonly occurring condition was large spatial coverage of algal blooms and elevated chlorophyll-*a* concentrations.
5. Overall eutrophic symptom expressions were geographically variable and appear to be explainable from existing phenomenological conditions of hurricane activity overall exacerbated by road construction along US 1 in the eastern areas of the bay.
6. If water flows are improved to the southern estuaries water quality is expected to improve and the number and scale of algal blooms to diminish. However, under current water flow conditions there will probably be little or no improvement in the conditions in the southern estuaries.
7. Monitoring of Barnes, Manatee and Blackwater Sounds was critical to being able to detect the impacts of road construction along US 1.
8. Monitoring long term consequences of nutrient releases into the southern estuaries from both natural (e.g. hurricanes) and human causes (e.g. road construction) and the interactions of hydrological restoration (e.g. more fresh water flow into the southern estuaries, particularly Florida Bay) is critical to continuing the evaluation and assessment restoration for the southern estuaries.

Florida Bay Algal Blooms

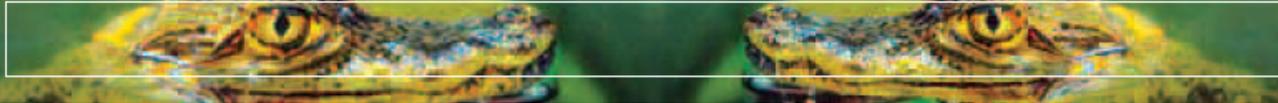
STOPLIGHTS

PERFORMANCE MEASURE	CURRENT STATUS ^a	CURRENT STATUS ^a
Chlorophyll a BARNES, MANATEE & BLACKWATER SOUNDS (BMB)		This region of the bay experienced an unusual cyanobacterial bloom in 2006. The bloom was initiated by a large spike in phosphorus from a combination of canal releases and highway construction in response to the active hurricane season. The bloom has abated somewhat but chlorophyll concentrations have not returned to previous levels.
Chlorophyll a NORTHEAST FLORIDA BAY (NEFB)		The current status is due to influence of the cyanobacterial bloom from Barnes, Manatee and Blackwater Sounds periodic expansion into this region.
Chlorophyll a NORTH-CENTRAL FLORIDA BAY (NCFB)		The current status is due to the presence of a seasonal cyanobacterial bloom in both early and late 2006. These blooms do not appear every year, but have occurred intermittently over the past 15 years.
Chlorophyll a SOUTH FLORIDA BAY (SFB)		The current status is due to the extension of the cyanobacterial bloom from the north-central region of the bay during both years. This has occurred intermittently over the past 15 years and it is unlikely that this signifies a long-term negative trend.
Chlorophyll a WEST FLORIDA BAY (WFB)		The seasonal diatom blooms in this region for both 2006 and current were not as dense or widespread as in the past.
Chlorophyll a MANGROVE TRANSITION ZONE (MTZ)		The chlorophyll concentrations were slightly higher in this region for 2006. This may have been due to the active 2005 hurricane season and is unlikely to indicate a negative long-term trend.
Chlorophyll a SOUTHWEST FLORIDA SHELF (SWFS)		The chlorophyll concentrations were slightly higher in this region for both 2006 & 2007. This may have been due to the active 2005 hurricane season and is unlikely to indicate a negative long-term trend.
Chlorophyll a NORTH BISCAYNE BAY (NBB)		The chlorophyll concentrations were higher than the baseline for the past four years.
Chlorophyll a CENTRAL BISCAYNE BAY (CBB)		The chlorophyll concentrations were higher than the baseline for the past four years.
Chlorophyll a SOUTH BISCAYNE BAY (SBB)		The chlorophyll concentrations were higher in this region for 2006. This area was also influenced by periodic expansion of the cyanobacterial bloom from Barnes, Manatee and Blackwater Sounds into this region.

^aData in the Current Status column for the algal bloom indicator reflect data inclusive of calendar year 2006.

Crocodylians (Alligators & Crocodiles)

KEY FINDINGS



SUMMARY FINDING:

On the whole, alligator and crocodile status remained constant during 2006, with only one area (Water Conservation Area 3A) showing a decline in status compared to previous years. However, the majority of locations show substantial deviations from restoration targets. 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. Loxahatchee National Wildlife Refuge (WCA-1) is the highest in south Florida and remains stable.
2. Overall status of alligators throughout the Water Conservation Areas is substantially below restoration targets and requires action in order to meet restoration goals.
3. While body condition of alligators is higher in the southern portion of Everglades National Park (ENP) than in other areas, overall status of alligators throughout ENP is below restoration targets and requires action in order to meet restoration goals.
4. Growth and survival components for crocodiles, while below restoration targets, appear stable at this time and are expected to increase given proper hydrologic conditions through restoration.
5. Restoration of patterns of depth and period of inundation and water flow are essential to improving performance of alligators in interior freshwater wetlands.
6. Restoration of patterns of freshwater flow to estuaries will improve conditions for alligators and crocodiles.
7. Continued monitoring of alligators and crocodiles will provide an indication of ecological responses to ecosystem restoration.

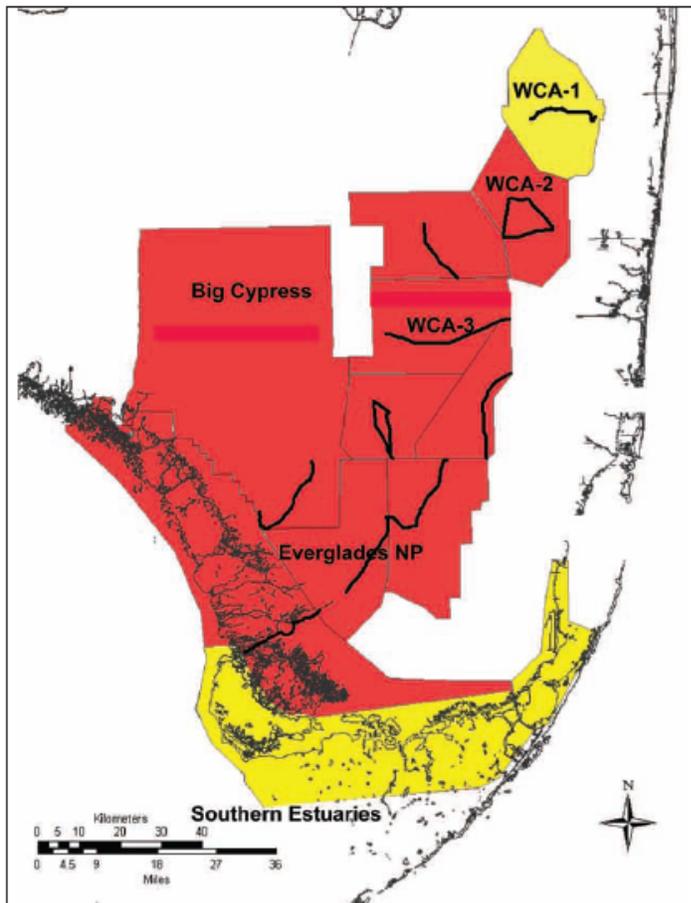


Figure 1. Map of Greater Everglades regions with stoplight ratings by region.

Crocodilians (Alligators & Crocodiles)

STOPLIGHTS

LOCATION	CURRENT STATUS ^a	CURRENT STATUS ^a
American Alligator		
A.R.M. Loxahatchee National Wildlife Refuge		Relative density (component score = 0.83) and body condition (component score = 0.17) combined for a location score of 0.5 and so current conditions do not meet restoration criteria, signifying that this area needs further attention.
Water Conservation Area 2A		Relative density (component score = 0.17) and body condition (component score = 0.5) combined for a location score of 0.34 and so current conditions are below restoration criteria.
Water Conservation Area 3A		Relative density in two of the three locations within WCA 3A is low (northern and southern areas) and higher (yellow) in the central area; body condition scores yellow in the north and central areas, and red in the south. The combined score of both components for the overall area is 0.31, which is well below restoration goals.
Water Conservation Area 3B		Relative density (component score = 0.17) and body condition (component score = 0.5) combined for a location score of 0.34 and so current conditions are below restoration criteria.
Everglades National Park		Relative density in all three locations within Everglades National Park is low. Body condition is higher (yellow) in Shark Slough and estuarine areas, but low (red) in northeast Shark Slough. The combined score of these two components for the overall area, and alligator hole occupancy in the inaccessible areas, is 0.35, which is well below restoration goals.
Big Cypress National Preserve		Relative density (component score = 0.17) and body condition (component score = 0.5) combined for a location score of 0.34 and so current conditions are below restoration criteria.
American Crocodile		
Everglades National Park		Juvenile growth (component score = 0.67) and survival (component score = 0.5) combined for a location score of 0.59 and so current conditions do not meet restoration criteria.
Biscayne Bay Complex		Juvenile growth (component score=0.67) does not meet restoration criteria. There currently is not enough data to calculate a survival component for this area.

^a Data in the Current Status column reflect data inclusive of calendar year 2006.

Oysters

KEY FINDINGS



SUMMARY FINDING:

On the whole, Eastern oyster status remained constant up to 2007. Given the duration of monitoring of this species, only the Caloosahatchee Estuary had sufficient data to infer trends and status of this indicator. Monitoring in other estuaries (St. Lucie Estuary, Loxahatchee Estuary, and Lake Worth Lagoon) is ongoing, and we expect will yield data to make trend and status assessments for the 2010 report. Current conditions in the Caloosahatchee Estuary show negative deviations from restoration targets, therefore restoration actions are merited. Status of oysters is expected to improve if hydrologic conditions are restored to more natural patterns.

KEY FINDINGS:

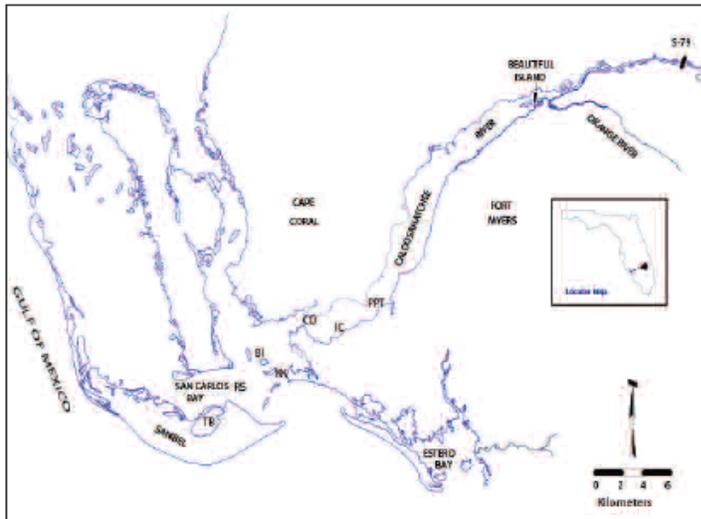


Figure 2. Oyster sampling locations within the Caloosahatchee Estuary. Locations (PPT = Pepper Tree Point, IC = Iona Cove, CD = Cattle Dock, BI = Bird Island and TB = Tarpon Bay) are from upstream to downstream along a salinity gradient.

1. Preliminary results suggest that oyster status in the Caloosahatchee Estuary is the highest in the Northern Estuaries and remains stable. It should be cautioned that insufficient data exists for other estuaries to infer trends and make statistical comparisons.
2. There is too much freshwater inflow into the Caloosahatchee Estuary in the summer months (usually due to flood water releases from Lake Okeechobee) and too little freshwater inflow into the estuary in the winter months (usually a result of water needs for human consumption), disrupting natural patterns and estuarine conditions. The oysters in the Caloosahatchee Estuary are still being impacted by this unnatural water delivery pattern. 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.
3. Overall status of oysters in the Caloosahatchee Estuary is below restoration targets and requires action in order to meet restoration goals.
4. Oyster responses and population in the Caloosahatchee Estuary, while below target, appear to be stable at this time and are expected to increase given proper hydrologic conditions through restoration.
5. 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.
6. Continued monitoring of oysters in the Caloosahatchee and other estuaries will provide an indication of ecological responses to ecosystem restoration and will enable us to distinguish between responses to restoration and natural variation.

Oysters

STOPLIGHTS

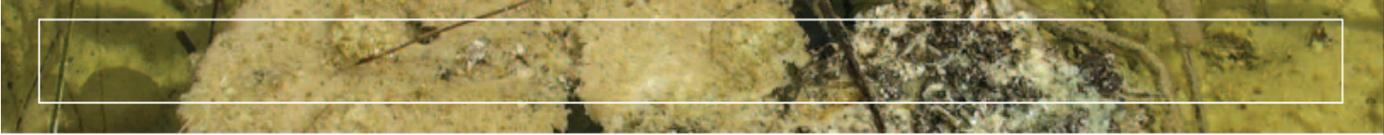
LOCATION	CURRENT STATUS ^a	CURRENT STATUS ^a
Eastern Oyster		
Caloosahatchee Estuary		The oysters in the Caloosahatchee Estuary are still being impacted by too much fresh water in summer and too little fresh water in the winter. Too much fresh water impacts reproduction, larval recruitment, survival and growth, while too little fresh water impacts the survival of oysters due to higher disease prevalence and intensity of <i>Perkinsus marinus</i> and predation. Current conditions do not meet restoration criteria, signifying that this area needs further attention.
St. Lucie Estuary		Insufficient data
Loxahatchee Estuary		Insufficient data
Lake Worth Lagoon		Insufficient data
Lostman's River (Southern Estuaries)		Insufficient data

○ Blank - Insufficient data to infer trends.

^a Data in the current status column reflect data collected between calendar years 2000 – 2007.

Periphyton-Epiphyton

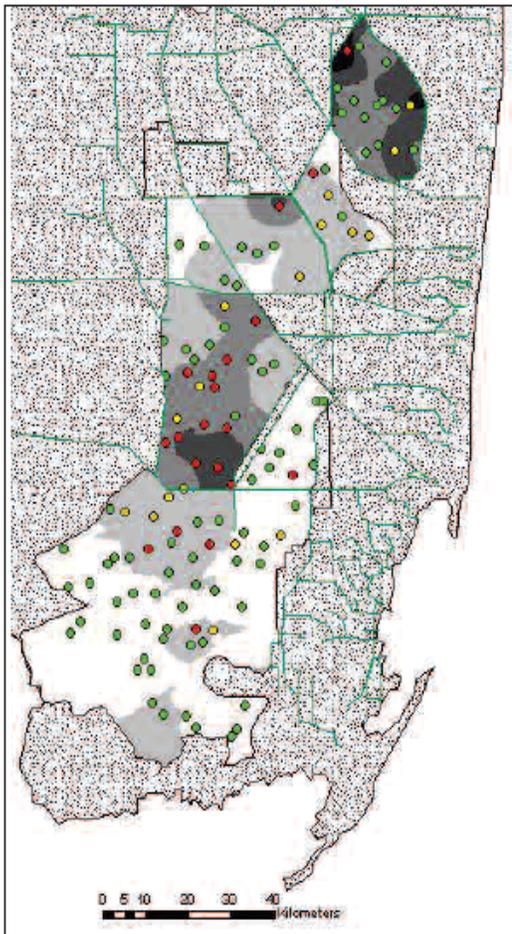
KEY FINDINGS



SUMMARY FINDING:

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, canals deliver above-ambient concentrations of both nutrients and calcium carbonate, both 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 have 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. The central slough of WCA-3A appears to be enriched, a trend that continues downstream of water control structures in Shark River Slough. Taylor Slough has remained relatively free of enrichment or hydrologic modifications that would influence periphyton composition.

KEY FINDINGS:



1. The percent (26%) of “altered” (red) sites was similar to that estimated for 2005 (25%) and are in areas close to canal sources of P. Areas in central WCA-3A need to be observed to determine if this is an area of unusual concern.
2. A total of 17% of sites were coded yellow for periphyton TP, and are centered near areas downstream of canal inputs of P.
3. A total of 60% of sites were coded yellow or higher for biomass (not shown), primarily reflecting a negative response to increasing P input.
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, but if accompanied by above-ambient P concentrations, cascading P effects are expected.

Periphyton-Epiphyton

STOPLIGHTS

PERFORMANCE MEASURE	CURRENT STATUS ^a	CURRENT STATUS ^a
WCA 1 A		
Biomass ¹		Periphyton shows evidence of enrichment near canals and calcareous mat biomass has increased due to calcite input from canals
Quality ²		
Composition ³		
WCA 2A		
Biomass		Periphyton TP has increased near canal inputs; composition and biomass reflect this long term input of above ambient P
Quality		
Composition		
WCA 3 A		
Biomass		This area has received some low level P enrichment, reflected in periphyton biomass and quality
Quality		
Composition		
SRS		
Biomass		SRS has received low level P enrichment for decades, reflected in periphyton biomass and quality
Quality		
Composition		
TS		
Biomass		TS has remained relatively unimpacted due to low levels of disturbance and low P inputs
Quality		
Composition		

^aData in the Current Status column for the periphyton indicator reflect data inclusive of calendar year 2006.

¹Biomass metric refers to the ash-free dry biomass of periphyton measured in m2 quadrats

²Quality metric refers to the total phosphorus content of periphyton

³Composition metric refers to the algal species composition of the periphyton

Juvenile Pink Shrimp

KEY FINDINGS



SUMMARY FINDING:

Juvenile Pink Shrimp density (number of shrimp per square meter) varies regionally and seasonally. It is consistently greatest in Johnson Key Basin and lowest in eastern Florida Bay and is generally most abundant in the fall. The status of juvenile pink shrimp in the assessment year, 2007, was poor; shrimp density was low compared to the historic record everywhere except Johnson Key Basin in spring of 2007 and South Biscayne Bay in fall of 2007. In Johnson Key Basin, the fall shrimp density of 5.2 shrimp per square meter was the 4th lowest in a 20-year period-of-record. Baselines, or periods-of-record (POR) for historical data sets against which “status” is compared are only 2 years long for all areas other than Johnson Key Basin and South Biscayne Bay, where the POR is 20 years. These 2 year baseline data sets add considerable uncertainty to the outcomes.

KEY FINDINGS:

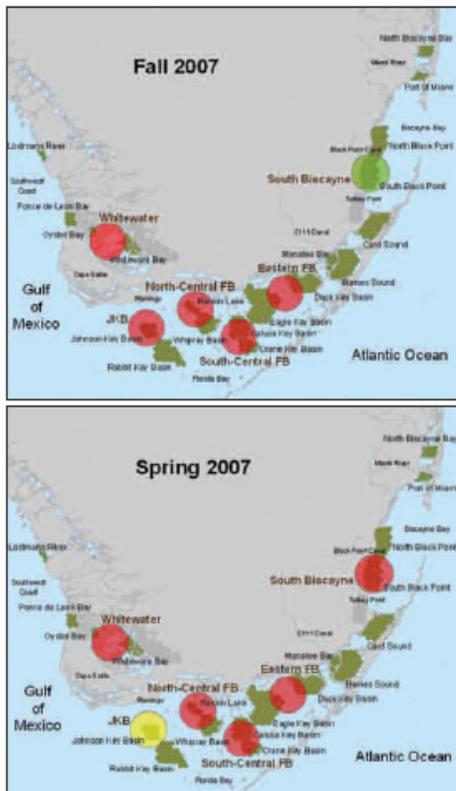


Figure 1. Map of South Florida estuaries with 2007 pink shrimp stoplight scores indicated for each response area, spring and fall.

1. Shrimp are substantially more abundant in the fall than in the spring in Whitewater Bay and most of Florida Bay, but similarly abundant seasonally in Biscayne Bay and eastern Florida Bay.
2. Shrimp density deteriorated over the last 3 years in Whitewater Bay relative to the 2-year POR. Spring density was in the green zone in 2005, the yellow zone in 2006, and the red zone in 2007. Fall density was in the yellow zone in both 2005 and 2006 and in the red zone in 2007.
3. Shrimp density in Johnson Key Basin declined in fall 2007 to low levels compared to the 20 year record and the previous two Monitoring Assessment Plan (MAP) years, 2005 and 2006.
4. The lack of synchrony of year-to-year patterns among response areas in 2005 and 2006 suggests that nearshore conditions are influencing shrimp densities. In contrast, low abundances, relative to previous years, throughout Florida Bay in 2007 may reflect poor spawning success offshore, or may be due to hypersalinity in central Florida Bay in the late summer and fall of 2007, which did not occur in 2005 or 2006.
5. The POR in areas other than Johnson Key Basin and, to a lesser extent, south Biscayne Bay, may be too short at this time to provide a reliable baseline (25th and 75th quartiles) against which to compare current MAP monitoring results.
6. The pink shrimp assessment will be improved with additional baseline data.

Juvenile Pink Shrimp

STOPLIGHTS

Spring Location		
PERFORMANCE MEASURE	CURRENT STATUS	CURRENT STATUS
South Biscayne Bay		Pink Shrimp Density was low compared to the historic record of 6 years (HM=0.45/m ²). ¹
Eastern Florida Bay		Density was low compared to short historic record (HM=0.05/m ²).
North-Central Florida Bay		Density was low compared to short historic record (HM=0.32/m ²).
South-Central Florida Bay		Density was low compared to short historic record (HM=0.77/m ²)
Johnson Key Basin		Density was neutral compared to short historic record of 20 years (HM=2.55/m ²).
Whitewater Bay		Density was low compared to short historic record (HM=0.56/m ²)
Fall Location		
South Biscayne Bay		Density was high compared to historic record (HM=0.72/m ²) but low compared to the nearly 3.0/m ² of 2005.
Eastern Florida Bay		Density was low compared to short historic record(HM=0.13/m ²)
North-Central Florida Bay		Density was low compared to short historic record (HM=1.50/m ²)
South-Central Florida Bay		Density was significantly lower than historic mean (HM=3.46/m ²)
Johnson Key Basin		Density was significantly lower than 20 year historic mean(HM=12.98/m ²)
Whitewater Bay		Density was significantly lower than short historic record(HM=4.62/m ²)

Note: Current Year = 2007.

HM=historic mean density.

Lake Okeechobee Littoral Zone

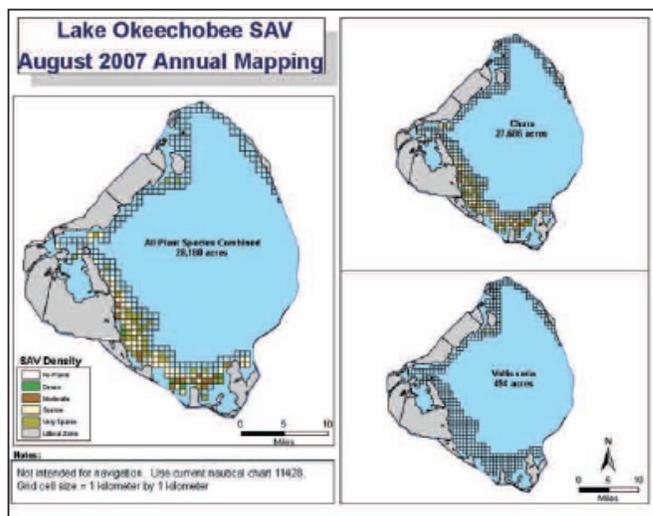
KEY FINDINGS



SUMMARY FINDING:

Submerged aquatic vegetation (SAV) declined from approximately 55,000 acres in 2004 to approximately 3,000 acres in 2006. Dramatic declines in SAV areal coverage were caused by the passage of three hurricanes; Frances and Jeanne in 2004 and Wilma in 2005. Physical disturbance (e.g. uprooting of plants) and prolonged turbidity resulted in the decline in SAV coverage, especially that of vascular plants such as eelgrass (*Vallisneria americana*) Hydrilla (*Hydrilla verticillata*) and peppergrass (*Potamogeton illinoensis*). *Chara* areal coverage rebounded between 2006 and 2007 and by August 2007 was similar to pre-hurricane coverage during the summer of 2004. A prolonged drought beginning in early 2007 has resulted in lake stages far below the long-term mean and dry conditions across most of the nearshore region which once contained vascular SAV. If a viable seed bank remains in these areas, then a return to more typical stages (>12 ft m.s.l) may result in sufficient vascular SAV recovery to classify these areas as yellow rather than red. If these areas remain dry or do not contain a viable seed-bank, then the red stoplight status may persist.

KEY FINDINGS:



1. Total SAV coverage decreased by approximately 95% between 2004 and 2006. Much of the SAV was likely lost due to physical disturbance by three hurricanes, and prolonged excessive water column turbidity (> 50 mg/L) prevented recovery.
2. *Chara* spp. areal coverage decreased tenfold between 2004 and 2006 but then rebounded to approximately pre-hurricane coverage between 2006 and 2007. *Chara* also has shifted offshore in response to historically low lake stages resulting from a prolonged drought during 2007-08. Prolonged low lake stage may result in large increases in *Chara* areal coverage during the upcoming summer.
3. Vascular SAV, primarily eelgrass (*Vallisneria americana*) Hydrilla (*Hydrilla verticillata*) and peppergrass (*Potamogeton illinoensis*) declined following the 2004 hurricanes and have not yet recovered. Hydrilla declined from approximately 24,500 acres in 2004 to 0 acres by 2006-07. Eelgrass declined from approximately 8,200 acres in 2004 to approximately 500 acres in 2007.

Peppergrass declined from approximately 6,700 acres in 2004 to 0 acres in 2006-07. During the winter of 2008, eelgrass was observed in the western nearshore area, and prolonged low lake stage may result in a favorable light regime for vascular SAV plant growth during the upcoming summer.

4. Seed-bank studies are currently being conducted to assess whether viable vascular SAV seeds exist in the nearshore region where the water column is shallow (<1 m). This region is further offshore than those areas where vascular plants typically have been found over the past decade.
5. An anticipated return to more typical lake stages (e.g. > 12 ft m.s.l) following the current drought may result in the reestablishment of the vascular SAV community.

Lake Okeechobee Littoral Zone

STOPLIGHTS

PERFORMANCE MEASURE	CURRENT STATUS ^a	CURRENT STATUS ^a
Submerged Aquatic Vegetation Areal Coverage NEARSHORE REGION		Submerged aquatic vegetation (SAV) coverage, especially vascular plant coverage, decreased dramatically since the fall of 2004. This decline in areal coverage was caused by physical disturbance (uprooting) from three hurricanes (Frances, Jeanne and Wilma) followed by prolonged water column turbidity. <i>Chara</i> spp. coverage dramatically increased during 2007, covering approximately 27,700 acres. However, vascular plants accounted for only approximately 500 total acres.

^aThe current status column is based on peak 2007 (August) SAV areal coverage and targets of 40,000 acres of total SAV coverage, with at least 50% being comprised of vascular plants.

Invasive Exotic Plants

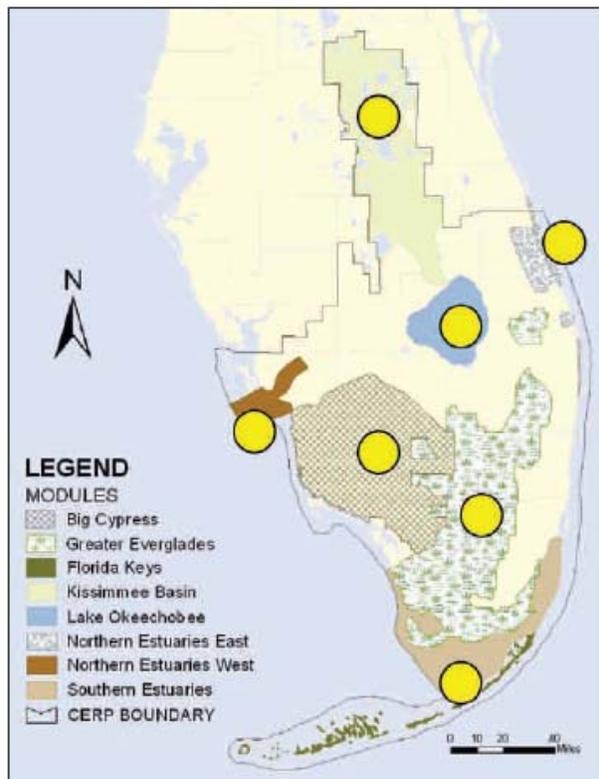
KEY FINDINGS



SUMMARY FINDING:

Most modules have some level of control program for high priority species and are showing progress with commonly known and wide spread species such as melaleuca, particularly on public lands. However, even Brazilian pepper and Old World climbing fern continue to be serious invaders in many modules, and several new and recently introduced species are being identified in many modules and little information exists on distribution or control methods. Monitoring programs are insufficient for tracking invasive species (especially new species) and predominantly cover only the Greater Everglades Module.

KEY FINDINGS:



1. Control of exotics has been successful but is limited to public lands and only to a few species.
2. Biological control on melaleuca is proving to be very effective as previously released insects are spreading and restoration of natural habitat is being documented.
3. For several other serious invasive plants a number of new insects have been released others are in development for release within 1-2 years.
4. All of the modules have significant invasive exotic plant problems that are documented to be affecting natural areas and altering natural habitats and processes and are not being controlled or monitored.
5. Monitoring programs to assess the trends in invasive exotic plants only cover the entire restoration area for 6 high priority species.
6. Monitoring that would identify new species or new distributions for existing species only covers portions of the Greater Everglades module, the other modules are not being monitored.
7. Due to the scale of the problem, new species are becoming established about which little is known, leaving the overall control picture mixed. Control and monitoring efforts are not keeping up with the establishment and expansion of exotic plant species.
8. Existing monitoring programs do not cover the other six modules therefore we are unable to determine where and when new species arrive and establish and assess success of control programs in these areas.
9. While we have made good progress with a number of species, we are still unable to control exotic plant species faster than they are invading and spreading. It is important to get ahead of the exotic plant invasion rate. Control and prevention programs would have to be expanded in order to do that.

Invasive Exotic Plants

STOPLIGHTS

LOCATION	CURRENT STATUS	CURRENT STATUS
KISSIMMEE RIVER		<p>The Good: Restoration efforts under way with good progress made with some species; Successful control programs for water hyacinth, waterlettuce and melaleuca. New control programs started for other recent invaders</p> <p>The Bad: Many non-indigenous species occur in this region for which little is known about their control, distribution and potential invasiveness</p>
LAKE OKEECHOBEE		<p>The Good: Large control programs under way provide sustained maintenance control for many species including melaleuca, floating aquatic weeds which is key in restoration efforts</p> <p>The Bad: Some serious species remain in module; continued disturbance of littoral zone may increase chances of new invasions</p>
NORTHERN ESTUARIES – EAST COAST		<p>The Good: Progress with melaleuca, Brazilian pepper and Australian pine; first biocontrol releases for Old World climbing fern;</p> <p>The Bad: Other species increasing, most not included in indicator monitoring programs; little known about majority of invaders; unable to assess status in repetitive way to determine trends</p>
NORTHERN ESTUARIES – WEST COAST		<p>The Good: Much progress made with melaleuca, Brazilian pepper, Australian pine; first biocontrol releases for Old World climbing fern; new biocontrol for Brazilian pepper under study</p> <p>The Bad: Other species gaining foothold and most not included in any indicator monitoring program; little known about large majority of invaders and not able to assess their status in an objective or repetitive way</p>
BIG CYPRESS		<p>The Good: Good control of melaleuca and Australian pine; first biocontrol releases for Old World climbing fern; occasional reductions on private lands</p> <p>The Bad: Two potentially serious invaders, crested floating heart and cogongrass are present in module, control efforts ineffective</p>
GREATER EVERGLADES		<p>The Good: Good control of melaleuca and Australian pine; biocontrol for melaleuca effective; first biocontrol releases for Old World climbing fern,</p> <p>The Bad: Old World climbing fern and Brazilian pepper still widespread, serious threats; continued rapid spread of these two species with little results from control efforts; still several other species present with little or no control effort or efficacy</p>
SOUTHERN ESTUARIES		<p>The Good: Control programs under way for many years; significant control achieved for Australian pine</p> <p>The Bad: Many new species invasions and possible effects unclear; most of Florida Bay not included in any monitoring program. Latherleaf, a serious invader of rare habitats along the southern coast of Park;</p>
FLORIDA KEYS		<p>The Good: Restoration efforts under way for several years; much progress made on Australian pine, sickle bush, laurel fig</p> <p>The Bad: Still some use of invasive species in private landscapes.</p>

APPENDICES

REMOVED FOR INSERTION LATER