

COORDINATING SUCCESS:

Strategy for Restoration of the South Florida Ecosystem
and

TRACKING SUCCESS:

**Biennial Report for FY 2001-2002 of the South Florida
Ecosystem Restoration Task Force**

to the

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

August 2002



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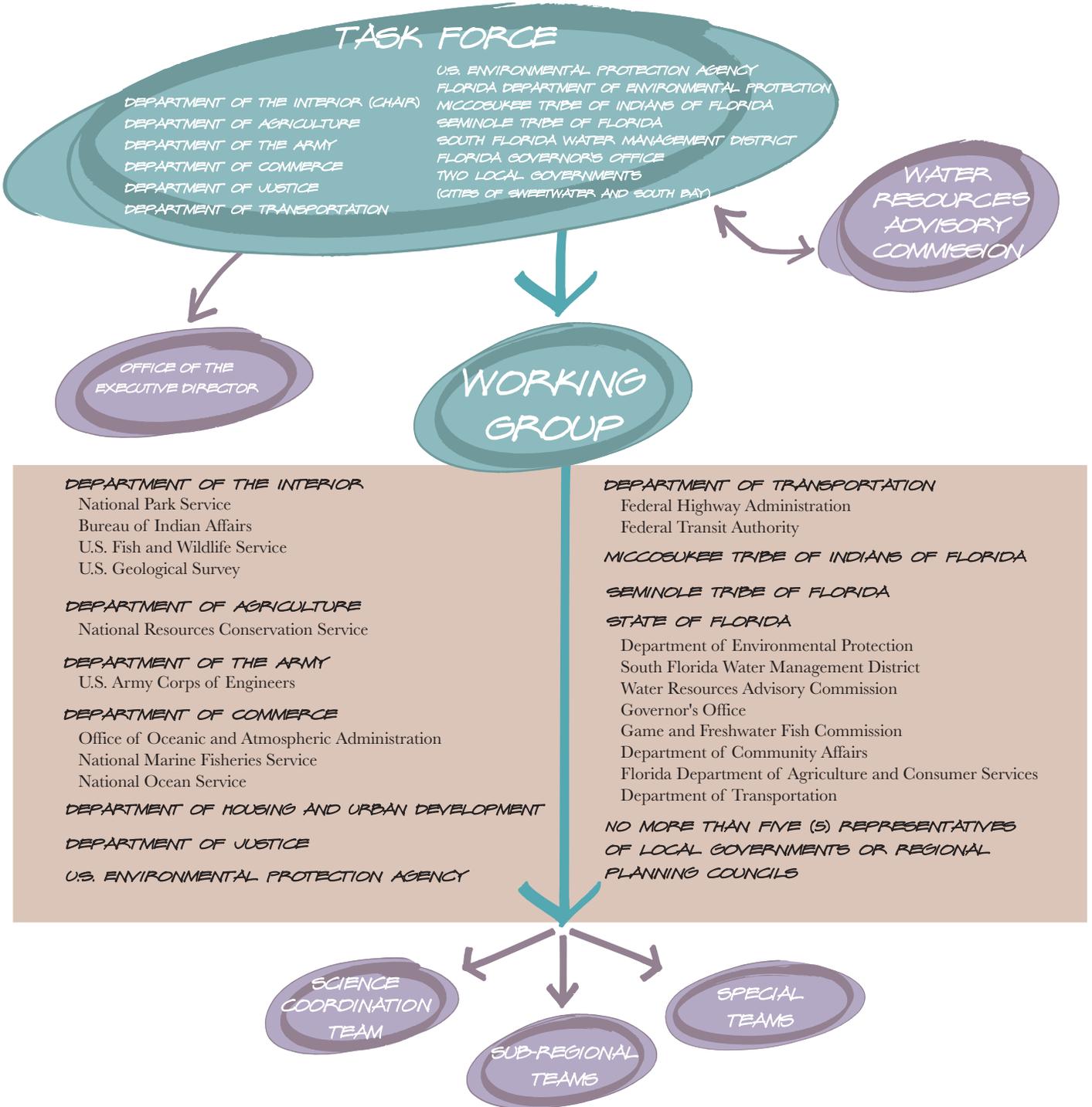


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SOUTH FLORIDA ECOSYSTEM RESTORATION EFFORTS ORGANIZATION



SOUTH FLORIDA ECOSYSTEM RESTORATION

TASK FORCE

Coordinating Success:
Strategy for Restoration of the South Florida Ecosystem

and

Biennial Report for FY 2001-2002

VOLUME I (OF 2)

AUGUST 2002

*This document is Volume 1 of a 2 volume report.
Volume 1 describes the coordination strategy and biennial report of the South Florida
Ecosystem Restoration Task Force; Volume 2 presents the individual projects that participating
entities have identified as supporting ecosystem restoration.*

*Volume 1 and Volume 2 combine information from federal, state, tribal, and local agencies and
therefore does not strictly follow any single agency's format.*

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Preamble

Significant progress has been made in developing plans and initiating action to restore the quality of the Everglades, and the entire South Florida ecosystem, one of America's unique natural areas. This revised strategy and biennial report 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, an intergovernmental group created by the Congress in 1996 to coordinate the restoration effort.

The revised strategy updates the strategy submitted by the Task Force in July 2000 and addresses comments published by the General Accounting Office in March 2001. The 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 the many governmental entities in order 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.

The overall premise of restoration is that the ecosystem must be managed with a systemwide perspective. Rather than dealing with issues independently, the challenge is to seek out the interrelationships and mutual dependencies 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 overriding challenge is not to decide who gets the water, but rather, how to fulfill all the water needs by ensuring that the needs of both the natural system and the built environment are met. Natural resource areas must be used 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.

The success of this comprehensive approach to a geographically large and complex ecosystem will depend upon the coordination and integration of many distinct activities carried out by various agencies at all levels of government, and with the input of all the many stakeholders. 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 goals and objectives for achieving that vision, to coordinate individual member projects so that they may be most timely and effective, to track and assess progress through indicators of success, and to facilitate the resolution of issues and conflicts whenever they arise. The goals and objectives presented in this strategy represent the combined contributions of hundreds of individual restoration projects underway or planned by the Task Force members. The indicators of success described in the strategy reflect the expected performance, in terms of ecosystem health, from all the projects when viewed collectively.

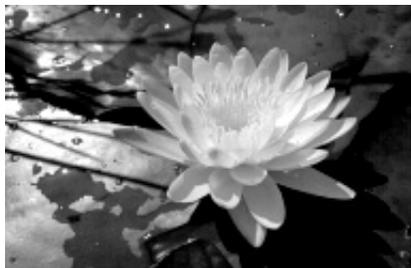
This strategy is not synonymous with the Comprehensive Everglades Restoration Plan (CERP); although the CERP is the single largest program in the strategy. Congress authorized the CERP in Section 601 of the Water Resources Development Act (WRDA) as a framework for modifications to the Central and Southern Florida Project to restore, preserve, and protect the South Florida ecosystem while providing for other water related needs of the region, includ-

ing water supply and flood protection. WRDA 2000 contains a number of provisions associated with implementation of the CERP, including programmatic regulations. The programmatic regulations help establish the administrative structure for carrying out the CERP. They establish a process for developing key implementation documents; they ensure that new technical and scientific information is incorporated through the adaptive assessment process; and they ensure that the goals and purposes of the CERP are met through establishment of a process to set interim goals for achieving restoration and targets for evaluating progress on achieving other water related needs of the region. The interim goals and the targets for evaluating progress toward achieving other water related needs will be developed pursuant to the programmatic regulations and will focus on CERP performance. These will be an important subset of the performance objectives and indicators of success described in the Task Force strategy.

It is important to note the significant contributions from other programs toward achievement of the Task Force's three strategic goals. While the CERP is vital to accomplishing all the goals, many other restoration projects are also important to achieving restoration. Some of the non-CERP projects that are also critical to achieving goal 1, get the water right, include the Kissimmee River Restoration, Modified Water Delivery, Canal-111, and Everglades Construction Projects. For goal 2, restore, preserve and protect natural habitats and species,

the state's Florida Forever Act land acquisition programs, along with the Conservation and Recreational Land (CARL) and Save Our Rivers (SOR) programs are the lynchpins of the effort to acquire important habitat lands. For goal 3, foster compatibility of the built and natural systems, state and local governments are now developing ways to coordinate land use and water supply planning to ensure availability of adequate water supplies to meet legislative direction to support existing development but not degrade the environment. The State of Florida's ongoing CARL, SOR, Communities Trust, Recreational Development and Assistance, and Greenways and Trails Programs increase the spatial extent of open space and multiply its benefits by linking 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.

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



Courtesy of SPWMD

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Glossary

Terms

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

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.

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

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.

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

Hydrology: The study of the properties, distribution, and effects of water. For purposes of this report, the quantity, timing, and distribution of water in the ecosystem.

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

Outcome: An end result. For purposes of this report, a quality of the restored South Florida ecosystem.

Output: Levels of work and effort. For purposes of this report, the products, activities, or services produced by a project or program.

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

Restoration: For purposes of this report, 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.

South Florida ecosystem / Greater Everglades 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, the Everglades, the Florida Keys, the Big Cypress Swamp, the 10,000 Islands, 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.

Success indicator: A subset of performance measures selected as a good representation of overall performance.

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.

Target: A measurable desired level of achievement during or following implementation of projects described in this strategy.

Vision: An aspiration of future conditions. For purposes of this report, 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.

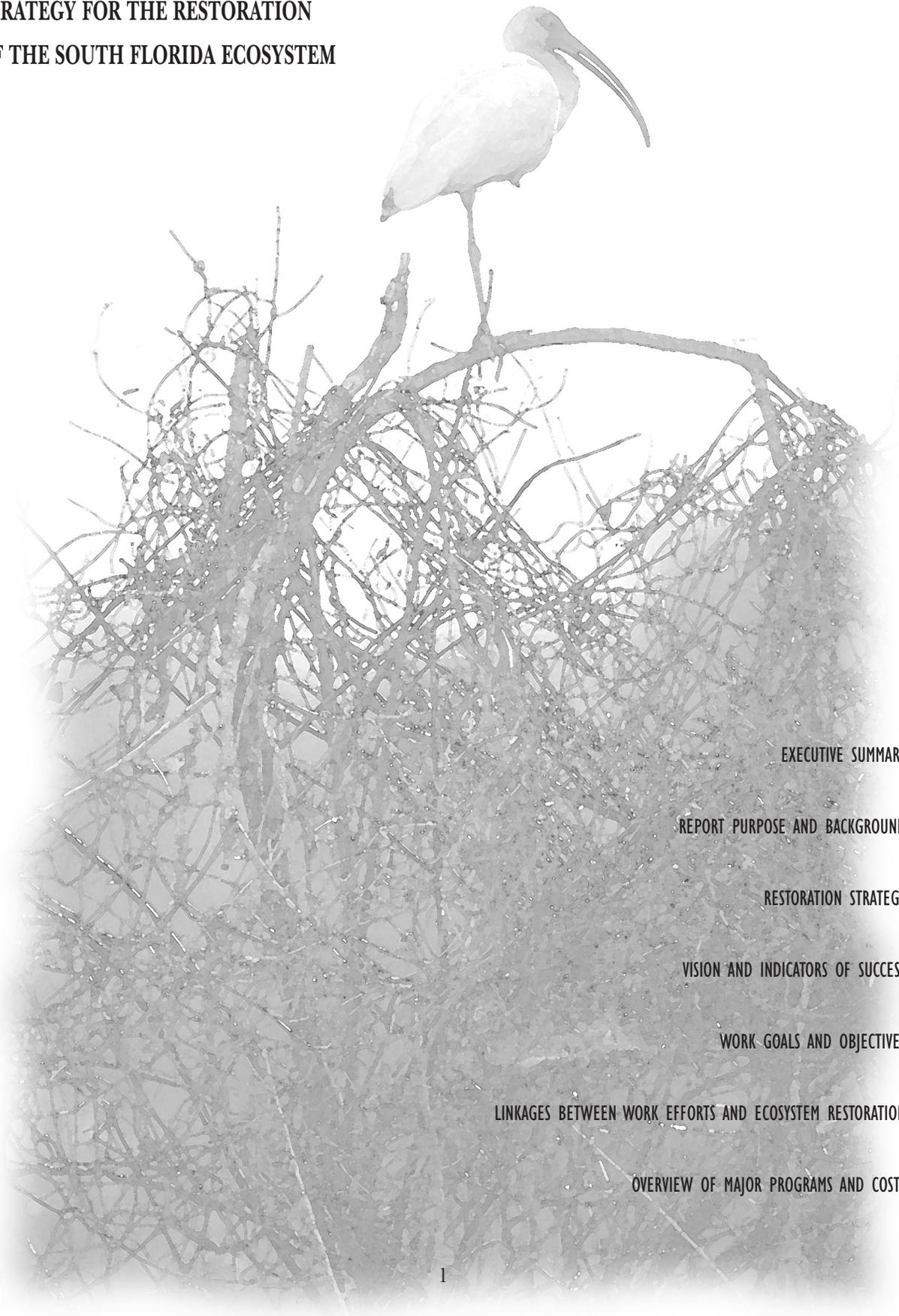
Wetlands: Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Acronyms

<i>ASR</i>	Aquifer storage and recovery
<i>BMP</i>	Best management practice
<i>C&SF</i>	Central and Southern Florida Project
<i>CARL</i>	Conservation and Recreational Lands
<i>CERP</i>	Comprehensive Everglades Restoration Plan
<i>EAA</i>	Everglades Agricultural Area
<i>EPA</i>	U.S. Environmental Protection Agency
<i>FCT</i>	Florida Communities Trust
<i>FDEP</i>	Florida Department of Environmental Protection
<i>FWS</i>	U.S. Fish and Wildlife Service
<i>GAO</i>	U.S. General Accounting Office
<i>MERIT</i>	Multi-Species/Ecosystem Recovery Implementation Team
<i>MSRP</i>	Multi-Species Recovery Plan
<i>NEWTT</i>	Noxious Exotic Weed Task Team
<i>PPB</i>	Parts per billion
<i>RECOVER</i>	Restoration Coordination and Verification Team
<i>SFWMD</i>	South Florida Water Management District
<i>SOR</i>	Save Our Rivers
<i>SWIM</i>	Surface Water Improvement and Management
<i>STA</i>	Stormwater treatment area
<i>TMDL</i>	Total maximum daily load
<i>USACE</i>	U.S. Army Corps of Engineers
<i>WCA</i>	Water conservation area
<i>WRDA</i>	Water Resources Development Act

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**COORDINATING SUCCESS:
STRATEGY FOR THE RESTORATION
OF THE SOUTH FLORIDA ECOSYSTEM**



EXECUTIVE SUMMARY

REPORT PURPOSE AND BACKGROUND

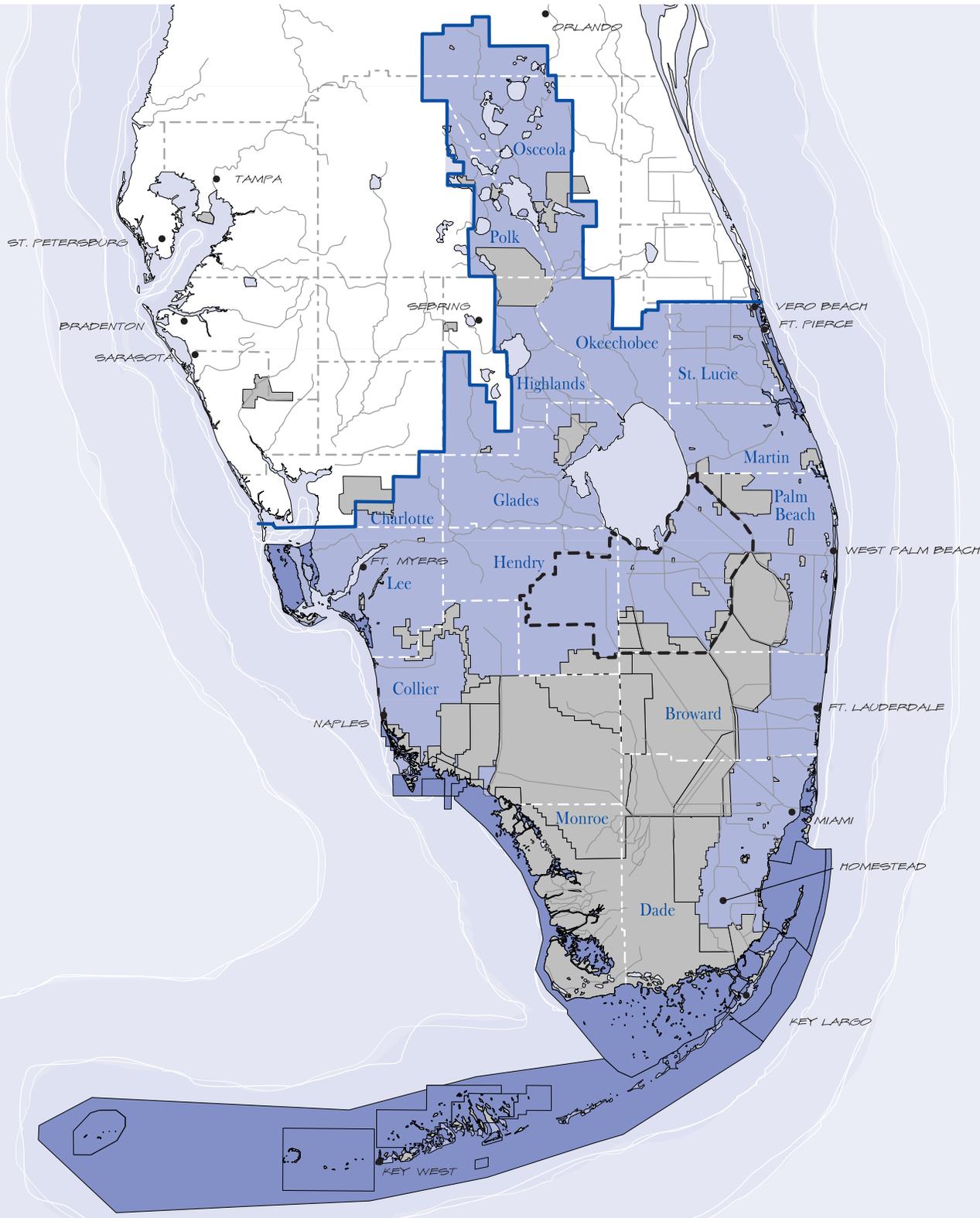
RESTORATION STRATEGY

VISION AND INDICATORS OF SUCCESS

WORK GOALS AND OBJECTIVES

LINKAGES BETWEEN WORK EFFORTS AND ECOSYSTEM RESTORATION

OVERVIEW OF MAJOR PROGRAMS AND COSTS



The South Florida Ecosystem

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

Executive Summary

Introduction

The South Florida ecosystem is an 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. This ecosystem not only supports the economy and the quality of life of the Floridians and the Native American Indians who live there, but also enriches the legacy of all Americans. It encompasses many significant conservation areas, including Everglades, Biscayne, and Dry Tortugas National Parks, Big Cypress National Preserve, the Fakahatchee Strand, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, Loxahatchee National Wild & Scenic River, John Pennekamp State Park, and the Florida Keys National Marine Sanctuary.



Courtesy of SFWMID

This ecosystem, which is sustained by water, has been seriously degraded by disruptions to the natural hydrology. Engineered flood-control and water-distribution systems for agriculture and urban development have dewatered large areas and greatly altered the quantity, quality, timing, and distribution of water flows in other locations. Agricultural runoff and urban stormwater have introduced phosphorus and other contaminants into the water systems, polluting lakes, rivers, and wetlands. Discharges of stormwater into estuaries and coastal waters have severely degraded aquatic habitats. Groundwater is

threatened by saltwater intrusion and other pollutants. These and other impacts have stressed the natural system, as evidenced by

- Fifty percent reduction in the original extent of the Everglades
- Ninety percent reduction in wading bird populations
- Sixty-nine species on the federal endangered or threatened list
- Declines in commercial fisheries in Biscayne and Florida Bays
- Thirty-seven percent loss of living corals at forty sites in the Florida Keys National Marine Sanctuary from 1996 to 2000

Purpose

The purpose of this document is to describe the existing federal and nonfederal programs designed to restore and sustain the imperiled South Florida ecosystem. Many federal, state, tribal, and local entities are working to address the ecological conditions in South Florida. The South Florida Ecosystem Restoration Task Force (the Task Force) coordinates and tracks the work. In 1996 Congress directed the Task Force to produce a restoration strategy. Additional reporting requirements include a biennial report on accomplishments, and a total cost report. This document fulfills all three of these requirements.

This document is for planning purposes only, is subject to modification, and is not legally binding on any of the Task Force members. Each Task Force entity retains all of its sovereign rights, authorities, and jurisdiction for implementation of the projects contained within this document.

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 are participating 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 Task Force was expanded to include tribal, state, and local governments by the Water Resources Development Act of 1996. Pursuant to its statutory duties, a Task Force working group of agency and tribal representatives (the working group) works to resolve conflicts among participants, coordinate research, assist participants, prepare an integrated financial plan, and report to Congress.

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

Restoration Strategy

GUIDING PRINCIPLES

The following principles will guide all aspects of ecosystem restoration and management:

- The ecosystem must be managed as a whole.
- The natural and built environments are inextricably linked in the ecosystem.
- Expectations should be reasonable.
- Decisions must be based on sound science.

- Environmental justice and economic equity need to be integrated into restoration efforts.
- Restoration efforts must meet applicable federal Indian trust responsibilities.

COORDINATION OF THE RESTORATION EFFORT

The Task Force provides a forum for consensus building and issue engagement among the entities involved in restoring the South Florida ecosystem. This 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. The Task Force has no overriding authority to direct its members. Instead, the members are accountable individually to their appropriate authorities and to each other for the success of the restoration.

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

FOCUS ON GOALS

This document establishes specific goals and measures that define 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 goals, be consistent with all the guiding principles, be timely, and support rather than duplicate other efforts. This document includes a master list of restoration projects and includes information about goals and objectives, start and finish dates, lead agencies, and funding.

TRACK AND ASSESS PROGRESS

The Task Force will facilitate the implementation of the individual entities' adaptive management processes to track and assess progress. The ability to anticipate problems early helps to minimize their effect on the total restoration effort.

Because each participating agency is responsible for its particular programs, projects, and funding, adaptive management decisions are made by the entities involved.

RECOGNIZE AND WORK WITH CONFLICTING RESTORATION GOALS

As restoration activities move forward in South Florida, there may be occasional conflicts between the broad goals described in this strategy and individual agency programs or missions. When such conflicts occur, the broad goals should prevail whenever possible, and it is the statutory duty of the Task Force to facilitate their resolution in ways that advance the broad goals of restoring natural hydrology and ecology throughout South Florida. The Task Force recognizes that it may sometimes be necessary to take short-term or interim management actions that are not immediately consistent with long-range goals, while allowing time for other activities more consistent with restoration goals to take effect. 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 broad restoration goals, the Task Force recognizes that it may be necessary to have Congress address such issues. (Additional views of the Miccosukee Tribe of Florida can be found in Appendix D).

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 Task Force will facilitate the prevention and resolution of conflict to the

extent possible by clarifying the issue(s), identifying stakeholder concerns, obtaining and analyzing relevant information, and identifying possible solutions.

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

Vision and Goals

The participants in the Task Force share the vision of a restored South Florida ecosystem that supports diverse and sustainable communities of plants, animals, and people. To this end, hundreds of different entities have been working for over a decade 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. The past, current, and future efforts of governmental entities in South Florida involve more than 200 projects related to three primary work goals. Subgoals and objectives have been established for each of these work goals as follows:



Courtesy of Kevin M. Burger Sr.

GOAL 1: GET THE WATER RIGHT

Subgoal 1-A: Get the hydrology right

- Objective 1-A.1: Provide 1.4 million acre-feet of surface water storage by 2036
- Objective 1-A.2: Develop Aquifer Storage and Recovery (ASR) systems capable of storing 1.6 billion gallons per day by 2026
- Objective 1-A.3: Modify 335 miles of impediments to flow by 2019

Subgoal 1-B: Get the water quality right

- Objective 1-B.1: Construct 70,000 acres of stormwater treatment areas by 2036
- Objective 1-B.2: Prepare plans, with strategies and schedules for implementation, to comply with total maximum daily loads for 100 percent of impaired water bodies by 2011

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 5.6 million acres of land identified for habitat protection by 2015.
- 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

- Objective 2-B.1: Coordinate the development of management plans for the top twenty South Florida invasive exotic plant species by 2010
- Objective 2-B.2: Achieve maintenance control status for Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern in all natural areas statewide by 2020
- Objective 2-B.3: Complete an invasive exotic plant species prevention, early detection, and eradication plan by 2005

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: Designate an additional 480,000 acres as part of the Florida Greenways and Trails System by 2008
- Objective 3-A.2: Increase participation in the Voluntary Farm Bill conservation programs by 230,000 acres by 2014
- Objective 3-A.3: Acquire an additional 2,500 acres of park, recreation, and open space lands by 2005
- Objective 3-A.4: Complete five brownfield rehabilitation and redevelopment projects by 2006
- Objective 3-A.5: Increase community understanding of 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

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

- Objective 3-C.1: Increase the regional water supply by 397 million gallons per day by 2005
- Objective 3-C.2: Increase volumes of reuse on a regional basis
- Objective 3-C.3: Achieve annual targets for water made available through the SFWMD Alternative Water Supply Development Program
- Objective 3-C.4: Reduce water consumption for irrigation 13,800 acre feet by 2004

The Task Force members believe that the efforts described in this report, managed through an adaptive management process, will achieve the restoration of the ecosystem: The region's rich and varied habitats—Biscayne Bay; Lake Okeechobee; 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.

The appropriate agencies will track progress toward restoring the ecosystem through approximately 200 indicators of success. These indicators, which range from the number of acres of periphyton in Everglades marshes to the frequency of water supply restrictions in urban and agricultural areas, represent the myriad physical, biological, and human elements that are all interrelated as parts of the ecosystem and are all important to ecosystem health. Many of these represent end results that may take up to fifty years to realize. Interim targets, which measure earlier indications of successional change, will allow assessment of incremental progress throughout the restoration.

The following indicators are a small representative subset of that much larger set of measures. They have been selected for inclusion in this iteration of the Task Force's strategy document and in the 2001-2002 biennial report to Congress, the Florida Legislature, and the Councils of the Miccosukee and Seminole Tribes because they



Courtesy of SFWMD

are currently believed to be among the most indicative of natural system functioning throughout the region as a whole and among the most understandable and meaningful to the American people and the residents of South Florida. These preliminary indicators may be refined as more information becomes available.

With the exception of the indicator for threatened and endangered species, which came from the U.S. Fish and Wildlife Service, the following indicators are from the 1999 *Baseline Report for the Comprehensive Everglades Restoration Plan*, prepared by the Restoration Coordination and Verification Team (RECOVER). The Task Force agencies that are tracking indicators of success provide data to the Task Force, which synthesizes the information for its reports. The current status of the following indicators is described in the biennial report that follows this strategy document.

- Improved status for fourteen federally listed threatened or endangered species, and no declines in status for those additional species listed by the state, by 2020
- An annual average of 10,000 nesting pairs of great egrets, 15,000 pairs of snowy egrets and tricolored herons combined, 25,000 pairs of white ibis, and 5,000 pairs of wood storks

- Urban and agricultural water supply needs met in all years up to and including those years with droughts with a one-in-ten-year return frequency
- At least 40,000 acres of total submerged vegetation, including benthic macro-algae, around the shoreline of Lake Okeechobee on an ongoing basis
- Approximately 900 acres of healthy oyster beds in the St. Lucie Estuary
- A nesting population of roseate spoonbills of at least 1,000 pairs annually distributed throughout Florida Bay, and some level of nesting by spoonbills in the coastal zone of the southwestern gulf coast
- No further degradation of tree islands, and recovery of as much as possible of the number and acreage of islands present in WCA-2 and WCA-3 in 1940
- A 65-70 percent coverage of Florida Bay with high-quality seagrass beds
- A long-term commercial harvest of pink shrimp on the Dry Tortugas fishing grounds that equals or exceeds the 600 pounds per vessel-day that occurred during the seasons 1961-62 to 1982-83; and an amount of large shrimp in the long-term average catch exceeding 500 pounds per vessel

Overview of Major Programs and Costs

The best estimate for the total cost to restore the South Florida ecosystem is \$14.8 billion. Of the total restoration cost, \$7.8 billion (1999 dollars) represents the cost of implementing the

Comprehensive Everglades Restoration Plan (CERP), which will be shared equally by the federal government and the state. The CERP outlines sixty-eight components that will take more than 30 years to construct. Because ongoing congressional authorization is required for the proposed projects included in the CERP, and because individual projects must undergo additional site-specific studies and analyses, the overall cost to implement this significant component of the restoration effort could be lower or higher, depending upon future analyses and site-specific studies.

The CERP builds on other plans and projects that were authorized by Congress or the Florida Legislature prior to and independent of the CERP. Taken together, these programs and projects represent an additional \$7 billion investment, of which \$2.55 billion are federal costs and \$4.48 billion are state costs.

The project schedules and the projections of outputs included in this report span multiple decades and depend on certain planning assumptions about state and federal budget requests and funding levels, optimized construction schedules, willing sellers, and other contingencies. These assumptions are likely to change as the project progresses, and appropriate revisions to this document will be necessary. Therefore, this document does not represent a commitment by the federal, state, or local governments or the tribes to seek appropriations for specific projects and activities at the funding levels laid out in this document.

Report Purpose and Background

Purpose

The purpose of this document is to describe the existing federal and nonfederal programs designed to restore and sustain the imperiled South Florida ecosystem. 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 greatly enriches the shared legacy of all Americans. It encompasses many significant conservation areas, including Everglades, Biscayne, and Dry Tortugas National Parks, Big Cypress National Preserve, the Fakahatchee Strand, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, John Pennekamp State Park, 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 South Florida Ecosystem Restoration Task Force (the Task Force) tracks and facilitates the coordination of the work. In 1996 Congress directed the Task Force to produce a restoration strategy. Additional reporting requirements include a biennial report on accomplishments and a total cost report. This document fulfills all three of these requirements.

Congress identified four elements to be included in the Task Force's restoration strategy. They wanted it to outline how the restoration effort will occur, identify the resources needed, establish responsibility for accomplishing actions, and link the strategic goals established by the participants to outcome-oriented goals. This document describes how the restoration effort is being coordinated: The Task Force members have agreed upon a vision for the results to be achieved; they have established three broad goals and measura-

ble 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 nonduplicative; and they are tracking progress toward both the work-oriented goals and the results-oriented vision. This strategy, along with the vision, goals, objectives, performance measures, and individual project data (including cost, responsible agency, and targeted completion dates) are all included in this document.

This document is for planning purposes only, is subject to modification, 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 contained within this document.



Courtesy of Kevin M. Burger Sr.

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 Task Force was expanded to include tribal, state, and local governments by the Water Resources Development Act of 1996 (WRDA 1996).

The act expanded the role of the Task Force to include the following duties:

- 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 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.

Pursuant to its statutory duties, a Task Force working group of agency and tribal representatives (the working group) works to resolve conflicts among participants, coordinate research, assist participants, prepare an integrated financial plan, and report to Congress.

The Task Force does not have any oversight or project authority, and participating agencies are responsible for meeting their own targeted 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. (The Task Force charter is included in appendix B.)



Courtesy of SFWMD

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 for agriculture and for residential and commercial development. Little by little, canals, roads, and buildings began to displace native habitats.

In 1934 national concern about the degradation of the South Florida Everglades led to the creation of Everglades National Park. 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.

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 diminishing natural environment for generations. The legislation establishing Everglades National Park specifically clarified the rights of the Miccosukee Tribe to live in the park, and set aside land along the border for the tribe to govern its own affairs in perpetuity.

The region 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 (C&SF) Project, 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 Everglades National Park. 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 correct quantity, quality, timing, and distribution of water to the Greater Everglades ecosystem has been the subject of much study. Many projects have been undertaken to restore natural water flows to this region. The original C&SF Project

water supply component for Everglades National Park was based on the understanding at the time. Subsequent research has indicated the importance of hydroperiods to the health of natural systems as opposed to a conventional water supply delivery.

Whereas historically most rainwater flowed slowly across the extremely flat landscape, soaking into the region's wetlands and forming the "River of Grass" that was the Everglades, the C&SF canal system, comprised of over 1,800 miles of canals and levees and 200 water control structures, drained an average of 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. Water quality also was degraded. Phosphorus runoff from agriculture and other sources polluted much of the northern Everglades and Lake Okeechobee and caused key 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. For example, in 1972 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 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 water conservation areas, Big Cypress Swamp, Everglades National Park, 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 Seminole Tribe and Miccosukee Tribe of Indians' customary use and occupancy rights in the Preserve. In 1989 Congress passed the Everglades Expansion and Protection Act, which added 107,600 acres to Everglades National Park and called for increased and improved water flows to 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 heightened phosphorus pollution of the Everglades. Of particular alarm 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.



Courtesy of SFWMD

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 Everglades

National Park and the Arthur R. Marshall Loxahatchee National Wildlife Refuge by creating artificial wetlands to filter agricultural wastewater. In 1993 the sugar cane industry agreed to adopt best management practices 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 final numeric water quality standards. In 1994 the agreements reached in litigation and mediation were reflected in the Everglades Forever Act adopted by the Florida Legislature.

The mid-1990s saw the establishment of two important consensus building forums for Everglades issues. In 1993 the South Florida Ecosystem Restoration Task Force was established through an 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 by WRDA 1996. In 1994 the Governor of Florida established the Governor's Commission for a Sustainable South Florida "to develop recommendations and public support for regaining a healthy Everglades ecosystem with sustainable economies and quality communities." The Task Force and the Governor's Commission have been instrumental in formulating consensus for 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 *Comprehensive Everglades Restoration Plan (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 ten years to implement the first ten years of the CERP.

The Seminole and Miccosukee Tribes, which have maintained their lifestyle in this natural system, became active participants in the dialogue on restoration and were formally added to the

Task Force under WRDA 1996. Because of the proximity of the Miccosukee Tribe to Everglades National Park, 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 the border for the tribe to govern in perpetuity. A primary purpose of this act was to clarify the right of the Miccosukee Tribe to live and govern its own affairs on the acreage set aside for the tribe by this federal action. 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 table 1.

Table 1. Milestones in South Florida Ecosystem Management

<p>1934 Everglades National Park is authorized.</p> <p>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.</p> <p>1972 Florida Land Conservation Act authorizes the issuance of bonds to purchase environmentally endangered and recreation lands.</p> <p>1974 Big Cypress National Preserve is created; legislation incorporates concerns of the Seminole Tribe and the Miccosukee Tribe for access to this preserve.</p> <p>1982 Florida Indian Land Claims Settlement Act gives the Miccosukee Tribe a perpetual lease from the State of Florida for access to and use of 189,000 acres in WCA-3A, which is to be kept in its natural state, and a 75,000-acre federal reservation in WCA-3A.</p> <p>1983 Governor’s Save Our Everglades Program outlines a six-point plan for restoring and protecting the Everglades ecosystem so that it functions more like it did in the early 1900s.</p>	<p>1984 Florida Warren Henderson Act authorizes the Department of Environmental Regulation (now the FDEP) to protect the state’s wetlands and surface waters for public interest.</p> <p>1985 Florida Local Government Comprehensive Planning and Land Development Regulation Act requires the development and coordination of local land use plans.</p> <p>1987 Compact among the Seminole Tribe, the State of Florida, and the SFWMD is completed. The Seminole Tribe transfers claims to lands critical to the State of Florida’s Everglades Construction Project in WCA-3 and the Rotenberger tract pursuant to the Indian Claims Settlement Act.</p> <p>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.</p> <p>1988 Federal government lawsuit against 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.</p>
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Table I. Milestones in South Florida Ecosystem Management continued

- 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.
- 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 ten 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 consent decree on Everglades water quality issued.
- 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** The Task Force is established to coordinate ecosystem restoration efforts in South Florida.
- 1993** Seminole Tribe is approved by the EPA 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 EPA 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; and allows the Task Force to address the full scope of restoration needs (natural and built).
- 1996** Section 390 of the Farm Bill grants \$200 million to conduct restoration activities in the Everglades ecosystem in South Florida.
- 1997** Seminole Tribe of Florida's water quality standards for the Big Cypress Reservation are approved by EPA.
- 1997** Miccosukee Tribe water quality standards are established for tribal lands located in WCA-3A, establishing a 10 parts per billion criteria for total phosphorus in tribal waters.
- 1997, 1998, 1999, AND 2000** Annual Interior Appropriations Acts provide for land acquisition by the NPS and the FWS in the Everglades ecosystem.
- 1998** Miccosukee Reserved Area Act clarifies the rights of the Miccosukee Tribe to live in Everglades National Park 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 EPA.

Table I. Milestones in South Florida Ecosystem Management continued

<p>1998 Miccosukee Reserved Area Act directs the Miccosukee Tribe to establish water quality standards for the Miccosukee Reserved Area (inflow points to Everglades National Park).</p> <p>1999 WRDA 1999 extends Critical Restoration Project authority until 2003; authorizes two pilot infrastructure projects proposed in the CERP.</p> <p>1999 Governor's Commission for the Everglades is designated by the Governor to advise the Task Force on issues relating to Everglades protection and restoration, environmental justice, and water resource protection, among other issues.</p> <p>1999 Miccosukee Tribe water quality standards are established for water passing through the Miccosukee Reserved Area into Everglades National Park. Miccosukee water quality standards are approved by EPA.</p> <p>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 ten years.</p> <p>2000 Florida Everglades Restoration Investment Act</p>	<p>creates a funding and accountability plan to help implement the CERP; commits an estimated \$2 billion in state funding to Everglades restoration over ten years.</p> <p>2000 WRDA 2000 includes \$1.4 billion in authorizations for ten 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.</p> <p>2001 Numeric water quality standard of 10 ppb proposed by FDEP in the Everglades Protection Area.</p> <p>2001 Water Resource Advisory Commission (WRAC) is established by the SFWMD Governing Board as a representative stakeholder group to advise them on all aspects of water resource protection in South Florida.</p> <p>2002 WRAC becomes an advisory body to the Task Force on ecosystem restoration activities.</p>
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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. Evidence of the seriousness of the problem includes

- 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 endangered or threatened list
- Declines in commercial fisheries in Biscayne and Florida Bays
- Loss of over five feet of organic soil in the Everglades Agricultural Area
- 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 water conservation areas

- Thirty-seven percent loss of living corals at forty sites in the Florida Keys National Marine Sanctuary from 1996 to 2000

Today South Florida is home to 6.5 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 thirty state parks and numerous state forests and wildlife management areas, including seventeen state aquatic preserves; eleven federal wildlife refuges and a national marine sanctuary; and three national parks, a national preserve, and a national estuarine research reserve. Everglades National Park 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.



Courtesy of SPWMD

Restoration Strategy

Guiding Principles

The following principles will guide all aspects of ecosystem restoration and management:

THE ECOSYSTEM MUST BE MANAGED AS A WHOLE

This is the overall premise that must drive ecosystem planning and management. It forces managers, scientists, and the public to 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 systemwide 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.

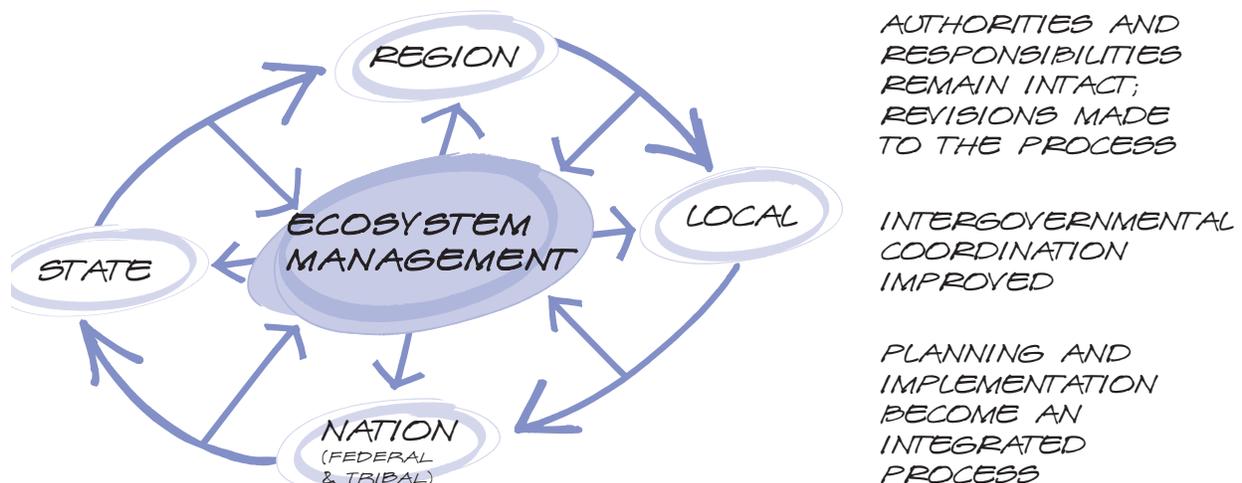
Holistic management by a variety of jurisdictions will require broad-based partnerships, coordinated

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 communications 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 meant 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 a healthy hydrologic regime and the improvement of habitat will not be enough to achieve the long-term sustainability of the South Florida ecosystem 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.

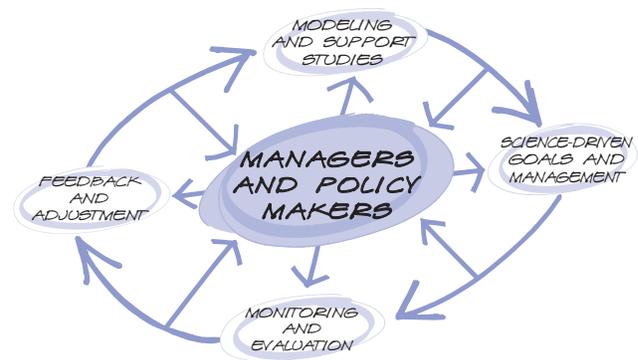
EXPECTATIONS SHOULD BE REASONABLE

The anticipated major ecological improvements will take many years to realize. The large-scale hydrological improvements that will be necessary to stimulate major ecological improvements will depend upon and follow the implementation of those features of the CERP that are 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 members have adopted an adaptive management process that will continuously provide managers with updated scientific information, which 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 interpretation that lead to a better understanding of the problem and then to the development of a series of alternative solutions. Once an alternative is selected and implemented, monitoring is used to assess the effectiveness of the action and to provide feedback on ways to modify it (if warranted). Similarly, monitoring data can be used to revise and refine the original model, thereby completing and continuing the interactive feedback loop of



decision making, implementation, and assessment.

A framework for promoting the application of sound science is included in appendix E. The framework describes the tools and methods for building scientific knowledge and applying it to ecosystem restoration.

ENVIRONMENTAL JUSTICE AND ECONOMIC EQUITY NEED TO BE INTEGRATED INTO RESTORATION EFFORTS

All the federal partners participating on 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. 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. 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 that small business concerns owned and controlled by socially and economically disadvantaged individuals are provided opportunities to participate in the restoration process. It also 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 rep-

resentation 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 needed to provide opportunities to socially and economically disadvantaged individuals and small business in the implementation of restoration programs and projects.



Courtesy of Treasure Coast Regional Planning Council

The Task Force and working group see this guiding principle as critical to long-term success and are committed to ensuring that it is tracked and part of the continuing discussion of their respective work plans. The Task Force working group has established a task team for outreach and environmental and economic equity. The team will solicit input about the effectiveness of outreach efforts to date and make written recommendations about how outreach activities can be better coordinated and made more effective in the future, including a recommendation for possible measurable objectives.

RESTORATION EFFORTS 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



Courtesy of SFWMD

under the Indian Trust Doctrine, and other applicable legal obligations. All federal agencies are responsible for meaningful consultation with the tribes under Executive Order 13175 and Secretarial Order 3206.

Coordination of the Restoration Effort

The role of the Task Force is not to manage the South Florida restoration, but to facilitate the coordination of the restoration, provide a forum for the participating agencies to share information about their restoration projects, and report on progress. Congress and other stakeholders are particularly interested in how each individual agency's efforts contribute to the larger framework of total ecosystem restoration. This document provides that information.



Courtesy of SFWMD

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. The Task Force has no overriding authority to direct its members. Instead, the members are accountable individually to their appropriate authorities and to each other for the success of the restoration.

The Task Force meets regularly to report on progress, facilitate consensus, and identify oppor-

tunities for improvement. The Task Force members coordinate and track the restoration effort as follows.

FOCUS ON GOALS

This document establishes specific goals and measures that define 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 goals, be consistent with all the guiding principles, be timely, and support rather than duplicate other efforts. This document includes a master list of restoration projects and includes information about goals and objectives, start and finish dates, lead agencies, and funding.

TRACK AND ASSESS PROGRESS

The Task Force will facilitate the coordination of the individual entities' adaptive management processes to track and assess progress. Adaptive management involves constantly monitoring project contributions and indicators of success 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 are available now. As project managers track incremental progress in 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 this strategic plan's goals and objectives as relevant information becomes available.



Courtesy of SPWMD

RECOGNIZE AND WORK WITH CONFLICTING RESTORATION GOALS

As restoration activities move forward in South Florida, there may be occasional conflicts between the broad goals described in this strategy and individual agency programs or missions. When such conflicts occur, the broad goals should prevail whenever possible, and it is the statutory duty of the Task Force to facilitate their resolution in ways that advance the broad goals of restoring natural hydrology and ecology throughout South Florida. The Task Force recognizes that it may sometimes be necessary to take short-term or interim management actions that are not immediately consistent with long-range goals, while allowing time for other activities more consistent with restoration goals to take effect. 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 broad restoration goals, the Task Force recognizes that it may be necessary to have Congress address

such issues (Additional views of the Miccosukee Tribe of Florida can be found in Appendix D).

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. In particular, the ability to resolve existing conflicts is complicated by (1) the large number of governmental entities involved at the federal, state, tribal, and local levels; (2) the differing, and sometimes conflicting, legal mandates and agency missions among the entities involved; and (3) the diverse stakeholder interests represented by the member agencies, 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 stakeholder concerns, obtaining and analyzing relevant information, and identifying possible solutions. The working group will regularly track issues in dispute and report to the Task Force when there are unresolved issues. Although these efforts are intended to facilitate conflict resolution, opportunities will always exist for parties to pursue conflicts through litigation. Litigation, however, is time consuming, costly, and uncertain, and it diverts resources from restoration efforts. Unfortunately, judicial resolution of legal claims does not always resolve the underlying conflict to the satisfaction of every party.

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

Vision and Indicators of Success

Vision

The participants in the South Florida Ecosystem Restoration Task Force share a 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 for over a decade 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 "Work Goals and Objectives" section of this report, 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 report, managed through an adaptive management process, will achieve the restoration of the ecosystem: 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 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 Ecosystem Health

The ultimate measure of Task Force success will be the restoration of the South Florida ecosystem. The appropriate Task Force agencies are tracking progress toward this end by developing and monitoring approximately 200 indicators of ecosystem health. These indicators, which range from the number of acres of periphyton in Everglades marshes to the frequency of water supply restrictions in urban and agricultural areas, represent the myriad physical, biological, and human elements that are all interrelated as parts of the ecosystem and are all important to ecosystem health. Many of these indicators of ecosystem health represent end results that may take up to fifty years to realize. Interim targets, which focus on earlier indications of successional change, will allow assessment of incremental progress.

The following indicators are a small representative subset of that much larger set of measures. They have been selected for inclusion in this iteration of the Task Force's strategy document and in the current biennial report to Congress, the Florida Legislature, and the councils of the Miccosukee and Seminole Tribes because they are currently believed to be among the most

indicative of natural system functioning throughout the region as a whole and among the most understandable and meaningful to the American people and the residents of South Florida. These preliminary indicators may be refined as more information is available. The selected indicators and their long-term targets are presented in this section of the strategy document, and the progress made over the past two-year period is described in the biennial report (which begins on page 71 of this document).

Responding to Congress's direction that the restoration effort be guided by, and continuously adapted to, the best science available, a multi-agency Restoration Coordination and Verification Team (RECOVER) has been established to support the implementation of the CERP with scientific and technical information. RECOVER is developing recommendations for the majority of the performance measures that will be used to assess restoration progress and to adaptively manage the restoration effort over time. Additional scientific and technical information about areas not covered by the CERP is being developed and refined by other federal, state, and local agencies.

With the exception of the indicator for threatened and endangered species, which came from the U.S. Fish and Wildlife Service (FWS), the following indicators are from the 1999 *Baseline Report for the Comprehensive Everglades Restoration Plan*, prepared by RECOVER.

INDICATORS OF TOTAL SYSTEM HEALTH

Threatened and Endangered Species

Significance and background. The FWS *Multi-Species Recovery Plan* (MSRP) identified more than four hundred species of plants and animals that are listed as threatened or endangered by the State of Florida, the FWS, or the National Marine Fisheries Service (NMFS). Of those, sixty-nine species are federally listed in this region. The MSRP contains information on the biology, ecology, distribution, status, trends, management, and recovery actions needed to recover the sixty-eight federally listed species under FWS

authority (the sixty-ninth species is under NMFS authority). The plan also identifies the biological composition, status, trends, and management and restoration needs of the twenty-three major ecological communities that compose the South Florida ecosystem. An ecosystem-based approach to species recovery will optimize benefits to the greatest number of imperiled species and other species of concern. It will also ensure that management and planning efforts reflect the best known step-wise processes for overall restoration of the communities. To achieve the recovery and restoration actions identified in the MSRP, the FWS is developing an ecosystemwide implementation strategy with support from a multi-agency/stakeholder team.

Target. Improved status for fourteen federally listed threatened or endangered species, and no declines in status for those additional species listed by the state, by 2020

Nesting Wading Birds

Significance and background. Large numbers of wading birds were a striking feature of the predrainage wetlands of South Florida. Single nesting colonies could contain as many as 50,000 to 100,000 pairs of birds. Although most of these colonies were decimated by plume hunters late in the nineteenth century, protective legislation and good habitat conditions during the early twentieth century allowed most of the nesting species to fully recover. The huge traditional rookery that was located along the extreme upper reaches of Shark River was estimated in 1934 to have been a mile long and several hundred feet wide. These "bird cities," which contained an estimated 75-95 percent of all wading birds nesting in the predrainage Everglades, had largely disappeared from the southern Everglades wetlands by the 1960s.

Substantial reductions in the total area of wetlands, changes in the location, timing, and volumes of flows, and the creation of unnatural water impoundments in the Everglades have been the factors that have combined to disrupt traditional nesting patterns, leading to a 90 percent decline in the total number of birds. Colonies that have been forced to relocate to the

Everglades water conservation areas have been smaller and less successful than were the colonies in the traditional estuarine rookeries such as Shark River. As a requirement for recovery, wading birds may need to reoccupy the now largely abandoned estuarine colony sites in southern and western Everglades National Park. In addition, wood storks must be able to return to more natural timing patterns for nesting (between November and January) than current water management practices allow.

Target. Recover, at a minimum, an annual average of 10,000 nesting pairs of great egrets, 15,000 pairs of snowy egrets and tricolored herons combined, 25,000 pairs of white ibis, and 5,000 pairs of wood storks

Urban and Agricultural Water Supply

Significance and background. A regional water supply system 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.

Target. Meet urban and agricultural water supply needs in all years up to and including those years with droughts with a one-in-ten-year frequency of occurrence

INDICATORS OF LAKE OKEECHOBEE HEALTH

Submerged Aquatic Vegetation

Significance and background. In shallow eutrophic lakes, submerged aquatic vegetation (plants that grow under water) plays a critical role in providing habitat for fish, wading birds, and other wildlife. When submerged aquatic vegetation is dense and widespread, water generally is clear and nutrient concentrations are low, reflecting active uptake of nutrients by the

plants. Shoreline areas of Lake Okeechobee supported more of this type of vegetation in the past; however, unnaturally high lake levels are believed to have precipitated its decline. 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.

Target. Sustain at least 40,000 acres of total submerged vegetation, including benthic macro-algae, around the shoreline of Lake Okeechobee on an ongoing basis, and of that total have at least 20,000 acres of rooted plants, in particular, eelgrass and peppergrass

INDICATORS OF ESTUARY HEALTH

Oyster Beds in the St. Lucie Estuary

Significance and background. Oysters are ecologically important as filter-feeding primary consumers, as prey for numerous higher consumers, and as habitat formers. The decline in oyster populations has contributed to ecologically damaging algal blooms in the estuary. The inability of the water body to assimilate the overabundance of algae produced by large volumes of nutrient-laden discharge is compounded by the low numbers of healthy oysters and other bivalves, which would otherwise help filter the water.

A healthy oyster population in the St. Lucie Estuary is only possible if a more stable salinity regime can be established by restoring a more natural quantity and timing of freshwater flows into the estuary. The target is based on areas with suitable substrate that will potentially recover appropriate salinity ranges as a result of CERP project implementation.

Target. Increase the extent of healthy oyster beds in the St. Lucie Estuary to approximately 900 acres

Roseate Spoonbills

Significance and background. Although the number of nesting spoonbills in extreme southern Florida increased from 15 pairs in the late 1930s to a peak of 1,254 pairs in 1979, numbers

in the 1990s have fluctuated between 500 and 750 pairs. The considerable reduction since the late 1970s in the number of nesting birds in once-large nesting colonies in northeastern Florida Bay has been due to deterioration in important feeding grounds in mainland estuaries between lower Taylor Slough and Turkey Point. Recovery of nesting in northeastern Florida Bay may depend on more natural flow volumes and patterns of freshwater into adjacent estuaries. Recovery of long-abandoned spoonbill nesting colonies along the southwestern gulf coast is more problematic, but it may also depend, at least in part, on freshwater flows necessary to recover historical salinity patterns.

Target. Two measurable targets have been set for roseate spoonbills: (1) Recover and stabilize the Florida Bay nesting population to at least 1,000 pairs annually distributed throughout the bay, including 250 pairs nesting in northeast Florida Bay (a doubling from the current 125 pairs). (2) Recover some level of nesting by spoonbills in the coastal zone of the southwestern gulf coast between Lostman's River and the Caloosahatchee River estuary

INDICATORS OF THE HEALTH OF THE EVERGLADES RIDGE AND SLOUGH

Tree Islands

Significance and background. Tree islands, which occur throughout the Everglades marshes, are small, isolated high spots, which historically have provided essential habitat for a wide variety of plants and animals. The islands serve as places of refuge for animals during periods of high water. They are sources of food and cover for wildlife and provide nesting sites for wading birds and freshwater turtles. Tree islands are highly important to the culture of both the Miccosukee and the Seminole Tribes. Hunters, fishermen, and recreational visitors to the Everglades consider tree islands to be symbolic of the health of the entire ecosystem.

Unnaturally deep water has had a devastating effect on the tree islands. In the water conservation areas, only four of the fifty-eight tree islands present in WCA-2A in 1940 were still present in 1995. Approximately half the tree

islands have been lost in WCA- 3A and -3B. Exotics are contributing to the devastation of tree islands. By 1997 Old World climbing fern had infested 21,000 acres of tree islands in WCA-1. While the majority of this infestation has been at the north end, the species has continued to spread through all of WCA-1 and has recently been identified in WCA-2 and WCA-3. It is not known if the tree islands can be restored. Further research is needed to determine the feasibility of rebuilding lost tree islands.

Target. No further degradation of tree islands, and recovery of as much as possible of the number and acreage of the islands present in WCA-2 and WCA-3 in 1940 (Additional research will be needed to identify the potential for recovering the acreage and number of islands present in 1940.)

INDICATORS OF FLORIDA BAY HEALTH

Seagrass Beds

Significance and background. The seagrass beds of Florida Bay are the keystone of the entire bay ecosystem. They provide critical food and habitat for shrimp, fish, and other estuarine organisms. The grass beds also stabilize the bay's sediments, thus promoting clear water and helping to minimize ecologically damaging algal blooms.

The first quantitative survey of Florida Bay seagrasses in 1984 revealed that the beds were already adversely impacted by the diversion of freshwater flows from the mainland Everglades and by other human activities of the twentieth century. A large-scale die-off of seagrass started in 1987. The judgment of the overall quality of seagrass beds in Florida Bay is based on the diversity of species of grasses in the beds.

Target. Coverage of 65 -70 percent of Florida Bay with high-quality seagrass beds distributed throughout the bay

Commercial Pink Shrimp Harvests

Significance and background. Pink shrimp are important both economically and ecological-

ly in South Florida. Until the decline of the Tortugas fishery, the pink shrimp was Florida's number one fishery species in terms of value, and the bulk of the landings came from the Tortugas. In addition, pink shrimp are a major link in the food chains of many fish, such as grey snapper and other game fish species of coastal South Florida. The growth and survival of young pink shrimp is influenced by salinity. Adult shrimp abundance, as reflected in catch rates per unit of effort, is influenced by the quantity and timing of freshwater inflows to the southwest gulf coast and Florida Bay nursery grounds. Restoration of flows more similar to rainfall-driven flows, which can be predicted by the Natural System Model, should benefit the Tortugas pink shrimp fishery.

Target. A long-term average rate of commercial harvest of pink shrimp on the Dry Tortugas fishing grounds that equals or exceeds the 600 pounds per vessel-day that occurred during the seasons 1961-62 to 1982-83, and an amount of large shrimp (defined as fewer than sixty-eight shrimp per pound) in the long-term average catch exceeding 500 pounds per vessel

Relationship between Task Force Strategy Indicators and CERP Programmatic Regulations

Section 601(h) of WRDA 2000 requires the Secretary of the Army, with the concurrence of the Secretary of the Interior and the Governor of Florida, to promulgate programmatic regulations within two years of enactment. The purpose of the programmatic regulations is to ensure that the goals and objectives of the CERP are achieved. WRDA 2000 requires that the programmatic regulations establish a process

- for the development of project implementation reports, project cooperation agreements, and operating manuals to ensure that the goals and objectives of the CERP are achieved

- to ensure that new scientific, technical, or other information, such as that developed through adaptive assessment, is integrated into the implementation of the CERP and
- to ensure the protection of the natural system, including the establishment of interim goals for achieving restoration and targets to evaluate progress on achieving other water related needs of the region, to provide a means by which the restoration success of the CERP may be evaluated throughout the implementation process

The USACE is currently developing the programmatic regulations and has begun the formal rulemaking process. The programmatic regulations establish a process to set the interim goals required by WRDA 2000 that will be based upon hydrologic, ecologic, and water quality performance measures, with levels of performance estimated for various time intervals during the CERP implementation process. This will provide a means by which the contributions of the CERP towards meeting Task Force goals 1 and 2—and the success of those activities in terms of ecosystem restoration—can be measured during the implementation process and reported as part of the required periodic reports to Congress.

While there is a relationship between the interim goals developed for the CERP and the indicators selected to track restoration progress as part of the Task Force strategy document and biennial plans, they are not the same. The Task Force indicators cover not only the CERP, but many additional activities, such as the MSRP, the control of invasive exotics, and the improvement of natural habitats not targeted by CERP projects—in effect aggregating indicators from all of these efforts.

Work Goals and Objectives

The ultimate result of all 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 described in the preceding "Vision" section of this document.

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) 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.



Courtesy of SPWMD

To this end, the Task Force members have identified three goals, related subgoals, and specific objectives for the work that must be done. The three work 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

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 the subgoals and goals—and ultimately the intended result of a restored ecosystem—were developed using the best information available gained through models, outputs, or research findings. Examples of these objectives include "develop aquifer storage and recovery systems capable of storing 1.6 billion gallons per day by 2020" and "protect 20 percent of the coral reefs by 2010."

The objectives included in this document 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, 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 reports.

The major projects contributing to each objective are listed in this section of the document. If more than one project is required to meet a sin-

gle 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 the master table at the end of this document, and many are described in detail in project sheets in Appendix F in Volume 2.

Goal I: Get the Water Right

Getting the water right means restoring natural hydrologic functions and water quality in wetland, estuarine, marine, and groundwater systems, while also providing for the water resource needs of urban and agricultural landscapes.

Water is the lifeblood of the South Florida ecosystem. The water flows today, however, have been reduced to less than one-third of those occurring in the historic Everglades. The quality of water that does enter the ecosystem has been

seriously degraded. Water does not flow at the same times or durations as it did historically, nor can it move freely through the system. The whole South Florida ecosystem has suffered. The health of Lake Okeechobee is seriously threatened. Many plants and animals that live in South Florida and the Everglades are in danger of becoming extinct because their habitats have been degraded, reduced, or eliminated. Excessive freshwater discharges in the wet season and inadequate flows in the dry season threaten the estuaries and bays that are critical nurseries and home to many fish and wildlife. Urban and agricultural areas are also adversely affected. Water shortages and water restrictions are occurring more frequently in some parts of South Florida.

Getting the water right must address four inter-related 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 must also 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 goal is that the right quantity of water, of the right quality, gets delivered to the right places and at the right times.

The following statements elaborate on what the Task Force members agree is what it means to get the water right. They are the result of a consensus-building exercise that first listed goals related to ecosystem restoration included in the planning documents of all the participating agencies and many local governments throughout the ecosystem, then synthesized that information into a single list of statements that all the Task Force participants could support. Based on that consensus, the water will be right when the following conditions are met: Natural hydrologic functions are restored in wetland, 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 this goal 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 in the implementation of restoration programs and projects. The Task Force and working group see this guiding principle as critical to long-term success and are committed to ensuring that it is tracked and part of the continuing discussion of their respective work plans.

SUBGOAL 1-A: GET THE HYDROLOGY RIGHT (WATER QUANTITY, TIMING, AND DISTRIBUTION)

How This Subgoal Will Be Implemented

On average 1.7 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 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 Everglades Agricultural Area, and in Palm Beach, Broward, and Miami-Dade Counties. These areas will encompass approximately 181,300 acres and will have the capacity to store 1.4 million acre-feet of water.



Kissimmee River prior to channelization, 1961.

Courtesy of SFWMD

Two rock mining areas in Miami-Dade County will be converted to in-ground storage areas.

Aquifer storage and recovery (ASR).

Subsurface water will be used to meet remaining water 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 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 will be built to store water 1,000 feet underground in the upper Floridan Aquifer. Pilot testing of this approach in different geologic areas is ongoing. If proven successful, wells will be located around Lake Okeechobee, in the Caloosahatchee Basin, and along the east coast. As much as 1.6 billion gallons a day may be pumped down the wells into underground storage zones. Because water does not evaporate when stored underground and less land is required for storage, aquifer storage and recovery has some advantages over surface storage. In particular, water stored in the aquifer can be made available for longer durations in years of severe drought conditions. The stored water will be fed into existing surface water impoundments for distribution through the existing surface water delivery system. ASR components represent approximately one-fifth of the total CERP costs.



Kissimmee River after channelization.

Courtesy of SFWMD

Removing barriers to sheet flow. Canals, internal levees, and other impediments to sheet flow will be removed or modified to reestablish the natural sheet flow of water through the system. The Kissimmee River Restoration Project will restore approximately forty 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 and C-111 projects will restore historic hydrological patterns to the Everglades. Most of the Miami Canal in WCA-3 will be removed, and twenty miles of the Tamiami Trail (U.S. Route 41) will be rebuilt with bridges and culverts, allowing water to flow more naturally into Everglades National Park. In the Big Cypress National Preserve, the levee that separates the preserve from the Everglades 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 water conservation areas, Everglades National Park, 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 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. (See Appendix A).

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 billion gallons of water per day to two billion gallons per day, 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 goals.

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 for 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.

Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

Table 2. Subgoal I-A: Get the Hydrology Right

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)			
Objective 1-A.1: Provide 1.4 million acre-feet of surface water storage by 2036	Target Date	Project	Output (acre-feet)	Status
	2001	Allapattah Flats	32,000	Completed
	2003	Ten Mile Creek	5,000	
	2006	Critical Project Seminole Big Cypress Reservation Water Conservation Plan	3,389	Underway
	2007	Acme Basin B Discharge	3,800	
	2009	Everglades Agricultural Area Storage Reservoir, Phase 1	240,000	Underway
	2009	Lake Okeechobee Watershed: Taylor Creek/Nubbin Slough Reservoir and STA	50,000	
	2009	Lake Okeechobee Watershed: North of Lake Okeechobee Storage Reservoir	200,000	
	2010	Indian River Lagoon South, C-44 Basin Storage Reservoir, and C-23/C-24/C-25/Northfork and Southfork Storage Reservoirs	190,000	Underway
	2010	Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation	10,000	Underway
	2011	Water Preserve Areas/L-8 Basin	48,000	
	2012	Seminole Tribe Water Conservation Project for Big Cypress Reservation	7,569	
	2014	Everglades Agricultural Area Storage Reservoir, Phase 2	120,000	
	2014	Bird Drive Recharge Area	11,500	
	2017	Site 1 Impoundment and Aquifer Storage and Recovery	15,000	
	2018	C-43 Basin Storage Reservoir and ASR	160,000	Underway
2019	Palm Beach County Ag Reserve Reservoir and ASR	240	Underway	
2036	Central Lake Belt Storage	190,000	Underway	
2036	North Lake Belt Storage	90,000	Underway	
Objective 1-A.2: Develop aquifer storage and recovery systems capable of storing 1.6 billion gallons per day by 2026	Target Date	Project	Output (million gpd)	Status
	2017	Site 1 Impoundment and Aquifer Storage and Recovery	150	
	2018	C-43 Basin Storage Reservoir and ASR	220	
	2019	Palm Beach County Agricultural Reserve Reservoir and ASR	75	
	2020	C-51 Regional Groundwater Aquifer Storage and Recovery	170	
	2026	Lake Okeechobee Aquifer Storage and Recovery	1,000	
Objective 1-A.3: Modify 335 miles of impediments to flow by 2019	Target Date	Project	Output (miles modified)	Status
	1997	Kissimmee Prairie Ecosystem	39.3	Completed
	2002	East WCA-3A Hydropattern Restoration	8.5	
	2003	Modified Waters Delivery Project	21	Underway
	2006	Florida Keys Tidal Restoration	0.6	
	2005	Canal 111 - North Spreader	4	Underway
	2009	Kissimmee River Restoration	22	Underway
2015	WCA-3 Decompartmentalization and Sheetflow Enhancement	240		

- Provide 1.4 million acre-feet of surface water storage by 2036
- Develop aquifer storage and recovery systems capable of storing 1.6 billion gallons per day by 2026
- Modify 335 miles of impediments to flow by 2019

The key projects needed to achieve these objectives and the schedule for their implementation are shown in table 2. The outputs listed in tables 2 and 3 and the measures and targets in the project summary table reflect strategy goals and are not intended to function as an allocation or reservation of water, which must be implemented through applicable law.

SUBGOAL 1-B: GET THE WATER QUALITY RIGHT

Runoff from agriculture and stormwater from urban areas has polluted much of the Everglades and Lake Okeechobee and impaired ecological conditions. 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 already 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 and mercury appear to be of particular concern.

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 concomitant with the CERP.

How This Subgoal Will Be Implemented

Everglades Forever Act. In 1994 the Florida Legislature passed the Everglades Forever Act, which codified measures to improve water quality and supported a joint proposal by the state and federal governments, approved by the U.S.

District Court in 2001, to modify the 1992 federal consent decree on Everglades water quality. One provision established the Everglades Construction Project, a series of six stormwater treatment areas (STAs) currently under construction between the Everglades Agricultural Area and the natural areas to the south. The main purpose of these treatment areas is to reduce the phosphorus loads in waters entering the conservation areas. Additionally, the state uses regulatory programs and best management practices to reduce phosphorus from urban and agricultural discharges. These programs and practices have reduced the phosphorus loads from the Everglades Agricultural Area to the Everglades. However, the final goals have not been met. The Urban and Tributary Basins Program is being developed to ensure that all other basins impacting the Everglades meet state water quality standards.

Generally, the stormwater treatment areas and best management practices are expected to reduce overall phosphorus levels to 50 parts per billion (ppb) or lower. In December 2001 the Florida Department of Environmental Protection (FDEP) issued a proposed standard for water quality in the Everglades Protection Area. This numerical standard quantitatively interprets the narrative standard found in the Everglades Forever Act. The proposal sets forth a phosphorus criterion of 10 ppb for all predominantly freshwater portions of the Everglades Protection Area. This is an ambient standard, meaning it is the typically desirable condition for phosphorous concentrations in the water column for maintaining the natural balance of aquatic flora and fauna in the Everglades. This proposed standard is also the default numeric standard that was established by the Florida Legislature for the Everglades Protection Area in the event a standard was not adopted through normal rulemaking.

Additional actions will be needed to meet the state long-term standard for natural areas. The SFWMD is researching advanced treatment (phase II) technologies to enhance the performance of the stormwater treatment areas and

potentially expand application to other tributaries of the Everglades. Implementation of phase II technology was conceived in both the state's Everglades Forever Act and the federal consent decree regarding protection of the Everglades. The South Florida Water Management District is pursuing, but has not yet recommended, a Phase II solution or an appropriate funding source (SFWMD 2002 *Consolidated Report*).

Tribal water quality standards. In May 1999 the Environmental Protection Agency (EPA) 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 has also adopted its own water quality standards on other parameters that

they feel will provide additional measures of protection for areas within their governance. 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 airboating), 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 Everglades ecosystem." While tribal waters are located within the interior of WCA-3A, which has median background total phosphorus concentrations ranging from 4 to 10 µg/l (often lower than the standard), the EPA determined that at present no data suggest that phosphorus concentrations less than or equal to 10 µg /l

Table 3. Subgoal I-B: Get the Water Quality Right

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)			
Objective 1-B.1: Construct 70,000 acres of stormwater treatment areas by 2036	Target Date	Project	Output (acres)	Status
	2000	STA-2 Works and Outflow Pump Station	6,430	Completed
	2000	STA-1 West Works and Outflow Pump Station	6,700	Completed
	2002	Lake Okeechobee Water Retention/Phosphorus Removal (not in matrix under this)	1,190	Underway
	2003	West Palm Beach Canal (C-51) and STA-1E	6,500	Underway
	2003	STA-5 Works	4,118	Underway
	2004	STA-3/4 Works	16,600	Underway
	2004	STA-6	2,222	Underway
	2005	Henderson Creek/Belle Meade Restoration	10	Underway
	2006	C-9 STA and Impoundment	2,500	Underway
	2008	Western C-11 Diversion Impoundment and WCA-3A and B Levee	1,600	Underway
	2008	North Palm Beach County: C-17 Backpumping and Treatment	550	
	2008	North Palm Beach County: C-51 Backpumping and Treatment	710	
	2009	Lake Okeechobee Watershed: Taylor Creek / Nubbin Slough Reservoir and STA	5,000	Underway
	2010	Miccosukee Tribe Water Management Area	900	
	2010	Lake Okeechobee Watershed : Lake Okeechobee Watershed Water Quality Treatment Facilities	4,375	Underway
	2014	Caloosahatchee Backpumping with Stormwater Treatment	5,000	
	2015	Lake Okeechobee Watershed : North of Lake Okeechobee Storage Reservoir	2,500	
	2015	Big Cypress/L-28 Interceptor Modifications	1,900	
	2036	Central Lake Belt Storage Area	640	
Objective 1-B.2: Prepare plans, with strategies and schedules for implementation, to comply with total maximum daily loads for 100 percent of impaired water bodies by 2011	Target Date	Project	Output (% of waters having plans)	Status
	2011	Total Maximum Daily Load for South Florida		

cause changes in flora or fauna. Citing peer-reviewed publications and technical reports, the EPA 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 mg /l is not protective of class III-A waters, then the tribe should revise its standard as necessary.

Other ongoing projects. Other ongoing projects include the Lake Okeechobee Protection Program, which includes a study that will identify a feasible method for reducing phosphorus loading in the lake and a federal/state/local agency program for protecting water quality in the Florida Keys National Marine Sanctuary.

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 goal 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 FDEP, in conjunction with the SFWMD, the Florida Department of Agriculture and Consumer Services, 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. Currently there are 154 water segments listed on the state's 303(d) list within the boundaries of the SFWMD.

The state is transitioning to a watershed management program that is based on a five-phase cycle. During the first phase, the water quality data for each basin will be assessed, and waters

determined to be potentially impaired will be identified. In phase two intensive monitoring will be 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 will be 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 will include a TMDL implementation plan, will be developed during the fourth phase.

The fifth and final phase will involve the implementation of the proposed management options, 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, or environmental resource permits to include permit conditions consistent with the TMDL. Once these plans have been adopted and implemented, progress will be monitored until waters are eventually certified as meeting water quality standards.



Courtesy of SFWMD

As there are nearly 800 water body segments and 2,000 parameters of concern on the current 303(d) list, it will take two rotations through the state to assess all the waters on the list. The first five-year cycle will cover those waters with a high priority, while those with a lower priority will be addressed in the second rotation.

Comprehensive Integrated Water Quality Feasibility Study. The *Comprehensive Integrated Water Quality Feasibility Study* will serve as a framework for integrating water quality restoration targets for South Florida water bodies into future planning, design, and construction activities included in the CERP. The RECOVER Team is developing regionally specific monitoring plans that include an extensive set of water quality parameters of concern.

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 the habitat restoration and preservation subgoals.

Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

- Construct 70,000 acres of stormwater treatment areas by 2036
- Prepare plans, with strategies and schedules for implementation, to comply with total maximum

daily loads for 100 percent of impaired water bodies by 2011

The key projects needed to achieve these objectives and the schedule for their implementation are shown in table 3. The outputs listed in tables 2 and 3 and the measures and targets in the project summary table reflect strategy goals and are not intended to function as an allocation or reservation of water, which must be implemented through applicable law.

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

Natural habitats and species will be restored when the diversity, abundance, and behavior of native South Florida animals and plants in terrestrial and aquatic environs are characteristic of predrainage conditions.

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.

Today the Florida panther and sixty-eight other animal or plant species are listed by the 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 out-competing native species and habitats. Exotic plants now make up approximately one-third of the total plant species known in Florida. The Florida Exotic Pest Plant Council has identified 125 of these as serious risks to Florida's natural areas and its threatened and endangered native plants and animals.



Courtesy of SPWMD

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 hydrological 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.

The following statements elaborate on what the Task Force members agree are what it means to

restore, preserve, and protect natural habitats. They are the result of a consensus-building exercise that first listed goals related to ecosystem restoration included in the planning documents of all the participating agencies and many local governments throughout the ecosystem, then synthesized that information into a single list of statements that all the Task Force participants could support. 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.



Courtesy of SPWMD

Efforts to achieve this goal 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



Courtesy of SFWMD

be required to provide opportunities for socially and economically disadvantaged individuals and small businesses in the implementation of restoration programs and projects. The Task Force and working group see this guiding principle as critical to long-term success and are committed to ensuring that it is tracked and part of the continuing discussion of their respective work plans.

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. As of September 2001 approximately 4.7 million acres had been acquired in South Florida for habitat conservation purposes, and the Task Force interagency Land Acquisition Team has identified an additional 904,985 acres for acquisition by 2015.

Over the past several decades, the federal government has acquired title to lands for conservation and public enjoyment of national parks, national preserves, and national wildlife refuges. 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. The Farm Security and Rural Investment Act of 2002 (Farm Bill) continues this support for ecosystem restoration through conservation programs that provide funding for the protection and improvement of agricultural land's wildlife values, restoring wetlands, providing for wildlife habitat improvement, control of exotics on private lands, and the purchase of conservation easements. 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 and national 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. Further, 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. It is a ten-year program that 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 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.

In recent years local governments have initiated, voted, and approved land acquisition programs for hundreds of millions of dollars that are helping 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. When completed, these efforts will yield a total of approximately 5.6 million acres for conservation and habitat protection. These lands also provide opportunities for water supply enhancement, natural-resource-based outdoor recreation, and environmental awareness and education to 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, ecosystemwide strategy (the MSRP) 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.

The MSRP addresses the recovery needs of South Florida's sixty-nine federally listed threatened and endangered species. A major section of that plan describes twenty-three of the natural vegetative communities in South Florida and identifies management actions needed to restore South Florida's ecosystem. Protecting critical habitat for threatened and endangered species will involve major coordination between the aggressive land acquisition programs of the state and the land acquisition plans for the national wildlife refuge system and the national park system. 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.

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 Florida Keys National Marine Sanctuary 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. Departments of Commerce and Interior and the State of Florida.

The Florida Keys National Marine Sanctuary'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 will protect an additional 46 nautical miles of reefs and marine habitats. Combined, these two areas will encompass 197 square nautical miles, protecting more than 10 percent of the coral reefs in the Florida Keys. Reefs elsewhere in South Florida have not received any significant protection to date.

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.

Table 4. Subgoal 2-A: Restore, Preserve, and Protect Natural Habitats

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.) ¹			
	Target Date	Project	Total Project Acres	Output Acres Acquired to Date Acres Remaining To Be Acquired
Objective 2-A.1: Complete acquisition of 5.6 million acres of land identified for habitat protection by 2015		STATE/SFVMD PROJECTS		
		Allapattah Flats/Ranch	34,221	0 34,221
		Atlantic Ridge Ecosystem	15,032	12,684 2,348
		Babcock Ranch	91,361	0 91,361
		Barfield Ranch	1,367	0 1,367
		Belle Meade	27,200	17,327 9,873
		Big Bend Swamp/Holopaw Ranch	54,425	0 54,425
		Biscayne Coastal Wetlands	2,241	0 2,241
		Bombing Range Ridge	39,073	0 39,073
		C-44 East Stormwater Treatment Area	2,400	0 2,400
		Caloosahatchee Ecoscape	15,391	0 15,391
		Camayen Ranch	5,254	0 5,254
		Catfish Creek	10,609	4,313 6,296
		Cayo Costa Island	1,932	1,890 42
		Charlotte Harbor Estuary/Flatwoods/Cape Haze	54,281	49,591 4,690
		Corkscrew Reg. Ecosystem Watershed (CREW)	59,008	24,877 34,131
		Corkscrew Regional Mitigation Bank	663	663 0
		Coupon Bight/Key Deer/Big Pine Key	3,452	1,371 2,081
		Cypress Creek/Trail Ridge	13,788	0 13,788
		Cypress Creek/Loxahatchee	4,184	0 4,184
		Dade County Archipelago	856	375 481
		Dupuis Reserve	21,875	21,875 0
		East Coast Buffer/Water Preserve Areas	70,883	35,836 35,047
		Estero Bay	16,740	7,568 9,172
		Fakahatchee Strand	80,231	60,723 19,508
		Fisheating Creek	168,360	51,475 116,885
		Florida Keys Ecosystem	7,611	1,987 5,624
		Frog Pond/L31N	10,600	9,570 1,030
		Grassy Island Ranch	10,000	9,480 520
		Hungryland Slough Natural Area	2,941	2,503 438
		Indian River Lagoon Blueway	5,136	1,332 3,804
		Juno Hills	440	336 104
		Jupiter Ridge	287	223 64
		Kissimmee Prairie Ecosystem	38,282	38,282 0
		Kissimmee River (Lower Basin)	62,628	54,934 7,694
		Kissimmee River (Upper Basin)	33,919	27,472 6,447
	Kissimmee-St. Johns River Connector	34,668	0 34,668	
	Lake Wales Ridge Ecosystem	12,770	8,938 3,832	
	Lake Walk-In-Water	4,615	4,009 606	
	Loxahatchee River	1,936	1,547 389	
	Loxahatchee Slough	15,200	825 14,375	
	McDaniel Ranch	7,000	0 7,000	
	Model Lands Basin	44,999	3,927 41,072	
	New Palm Dairy	2,135	2,135 0	
	Nicodemus Slough	2,219	2,219 0	
	North Fork of the St. Lucie River	3,800	571 3,229	
	North Key Largo Hammocks	4,508	356 4,152	
	North Savannas	930	0 930	
	Okaloocoochee Slough	37,210	34,982 2,228	
	Osceola Pine Savannas	42,291	161 42,130	
	Pal-Mar	35,795	18,061 17,734	
	Panther Glades	21,000	0 21,000	
	Paradise Run	8,065	3,128 4,937	

¹ Data Source: FDEP Division of State Lands as of 9/30/01

Table 4. Subgoal 2-A: Restore, Preserve, and Protect Natural Habitats continued

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)					
Objective 2-A.1: Complete acquisition of 5.6 million acres of land identified for habitat protection by 2015				Output		
	Target Date	Project	Total Project Acres	Acres Acquired to Date		
				Acres Remaining To Be Acquired		
		Parker-Poinciana	1,970	0	1,970	
		Pineland Site Complex	250	1	249	
		Rookery Bay	18,721	18,579	142	
		Rotenberger/Holey Land Tract	79,170	71,418	7,752	
		Shingle Creek	7,655	1,281	6,374	
		Six Mile Cypress	1,741	869	872	
		South Fork of the St. Lucie River	184	184	0	
		South Savannas	6,046	5,083	963	
		Southern Glades	37,620	32,452	5,168	
		Southern Golden Gate Estates	55,566	50,125	5,441	
		Ten Mile Creek	1,266	911	355	
		Tibet Butler Preserve	439	439	0	
		Twelve Mile Slough	3,300	0	3,300	
		Upper Econ Mosaic	30,471	0	30,471	
		Upper Lakes Basin Watershed (ULBW)	43,500	12,574	30,926	
		Water Conservation Areas - 1, 2 and 3	862,800	819,535	43,265	
		Wellington/ACME Marsh	1,050	0	1,050	
		Yamato Scrub	207	207	0	
		Sub-total of State/SFWMD Projects	2,397,768	1,531,204	866,564	
		FCT, STATE PARKS, & WMA'S				
			State Florida Communities Trust Lands	18,024	15,108	2,916
			State Park Lands	101,438	88,084	13,354
			State Wildlife Management Areas	30,260	29,970	290
			Sub-total of FCT, State Parks, & WMA's	149,722	133,162	16,560
		FEDERAL CONSERVATION LANDS				
			A.R.M. Loxahatchee NWR	149,016	145,787	3,229
			Big Cypress National Preserve	574,454	573,744	710
		Big Cypress National Preserve Addition	146,117	141,783	4,334	
		Biscayne National Park	172,924	172,542	382	
		Caloosahatchee NWR	40	40	0	
		Cape Romano/Ten Thousand Island NWR	35,037	35,034	3	
		Crocodile Lake NWR	7,100	6,562	538	
		Everglades National Park	1,399,078	1,398,617	461	
		Everglades National Park Expansion	109,504	103,785	5,719	
		Florida Panther NWR	26,529	26,529	0	
		Great White Heron NWR	194,995	192,584	2,411	
		Hobe Sound NWR	1,130	980	150	
		J. N. Ding Darling NWR	7,325	6,385	940	
		Key West NWR	208,308	208,308	0	
		Matlacha Pass NWR	393	393	0	
		National Key Deer Refuge	12,133	9,149	2,984	
		Pine Island NWR	602	602	0	
		Sub-total Federal Conservation Lands	3,044,685	3,022,824	21,861	
		GRAND TOTAL HABITAT ACQUISITION	5,592,175	4,687,190	904,985	
Objective 2-A.2: Protect 20 percent of the coral reefs by 2010	Target Date	Project	Output (% of reefs protected)		Status	
	2001	Establish an ecological reserve and research natural area encompassing 197 square nautical miles of coral reefs and associated habitats in the Tortugas region	10+ percent of reefs in Florida Keys		Completed	
Objective 2-A.3: Improve habitat quality for 2.4 million acres of natural areas in South Florida	Target Date	Project	Output		Status	
		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 habitat units that would be improved through implementation of the CERP projects. Table 7-18 in this publication identifies in detail which projects are anticipated to achieve this objective. There are some projects included in our tracking matrix that exemplify how this objective will be achieved.				

Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

- Complete acquisition of 5.6 million acres of land identified for habitat protection by 2015
- 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 table 4.

SUBGOAL 2-B: CONTROL INVASIVE EXOTIC PLANTS

The MSRP identifies the control of 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 have spread in natural areas to the extent that the native plants and animals are in danger of being replaced in their entirety. The most widespread and serious exotic plants are listed below, along with the extent of their current infestations.

How This Subgoal Will Be Implemented

The Noxious Exotic Weed Task Team established by the Task Force has developed an assessment and strategy for managing invasive exotic plants. The following three actions included in that strategy are the highest priorities for ecosystem restoration. Other actions are still being developed and will be incorporated into updates of this document.

Species management plans. Species management plans, when adequately funded and implemented, have provided successful control of invasive exotic plants. These plans offer the advantage of replacing piecemeal efforts of managing exotic plants on individual sites, or controlling a few plants in broader regions, with multi-agency programs that integrate statewide invasive plant

Terrestrial Species	Extent of Infestation
Melaleuca (<i>Melaleuca quinquenervia</i>)	400,000 acres
Brazilian pepper (<i>Schinus terebinthifolius</i>)	1,000,000 acres
Australian pine (<i>Casuarina</i> spp.)	200,000 acres
Old World climbing fern (<i>Lygodium microphyllum</i>)	100,000 acres
Aquatic Species	
Hydrilla (<i>Hydrilla verticillata</i>)	
Water hyacinth (<i>Eichornia crassipes</i>)	
Water lettuce (<i>Pistia stratiotes</i>)	

management activities, organizations, priorities, and resources. More than twenty exotic plants need attention, and developing plans for just the top twenty will take several years.

Six species in Florida (melaleuca, Brazilian pepper, Old World climbing fern, hydrilla, water lettuce, and water hyacinth) have statewide species-based management plans. Plans must be developed for each species because each has species-specific characteristics that need to be addressed.

Maintenance control. Maintenance control is an approach that applies routine, coordinated management to reduce invasive exotic plant populations and maintain them at the lowest feasible levels. Many techniques are used, including mechanical removal, chemical treatment, and predatory biological controls. The three major aquatic species (hydrilla, water hyacinth, and water lettuce) are currently in maintenance control. Achieving maintenance control for melaleuca is well underway; infestations have been reduced from approximately 500,000 to less than 400,000 acres. Additional resources are needed to completely implement the melaleuca plan. Plans for Brazilian pepper and Old World climbing fern have been minimally implemented due to lack of resources. Plans and control programs for other priority species need to be incorporated into the multi-agency management framework and invasive exotic plant strategy.

The SFWMD and the NPS Southeast Regional Office are jointly implementing Exotic Plant Control Teams for Florida national parks and natural lands within the water management dis-



Courtesy of Kevin M. Burger Sr.

tract. These teams are trained to identify and remove invasive exotic plants. After locating populations of plants for control these teams move in and eradicate them, also helping the individual agency bring the species under maintenance control.

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 imprac-

tical. 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

At no time in an exotic species control program, even when the population is under control, should resources drop below the maintenance-level requirement, or the species will expand and reinvade to precontrol levels and the program must start from zero once again. Weed management is like any other long-term program in that sufficient funds must be available on a continuous basis in order to achieve maintenance control. A reduced level of resources may be all that is needed to maintain control. However, discontinuing this funding has been a problem that has

Table 5. Subgoal 2-B: Control Invasive Exotic Plants

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)			
Objective 2-B.1: Coordinate the development of management plans for the top twenty South Florida invasive exotic plant species by 2010	Target Date	Project	Output (plans)	Status
	2010	Management plans for melaleuca, Brazilian pepper, Old World climbing fern, hydrilla, water lettuce, and water hyacinth Remaining plans		20% completed Prioritization underway
Objective 2-B.2: Achieve maintenance control status for Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern in all natural areas statewide by 2020	Target Date	Project	Output (control)	Status
	2020	Integrated Maintenance Control Program		Underway
Objective 2-B.3: Complete an invasive exotic plant prevention, early detection, and eradication plan by 2005	Target Date	Project	Output (plans)	Status
	2005	Invasive Exotic Plant Prevention Plan		Underway

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 had multi-agency coordination and adequate funding.

To bring the other high priority species under maintenance control, agencies will need to organize formally to implement similarly complex management programs. Any of these factors will adversely affect success: Lack of a comprehensive plan, failure to integrate individual control programs, inadequate interagency coordination, inadequate funding and implementation, or a lack of motivation among the agencies to coordinate on a statewide 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 species continues to increase the potential for infestations of exotic plants.

Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

- Coordinate the development of management plans for the top twenty South Florida invasive exotic plant species by 2010
- Achieve maintenance control status for Brazilian

pepper, melaleuca, Australian pine, and Old World climbing fern in all natural areas statewide by 2020

- Complete an invasive exotic plant species prevention, early detection, and eradication plan by 2005

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

Goal 3: Foster Compatibility of the Built and Natural Systems

Compatibility of the built and natural systems will be realized when the built environment is compatible with ecosystem restoration and preservation goals.

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 public services have 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 and Greater Everglades ecosystems. The imbalance has contributed to a renewed focus by state, local, regional, and national decision makers and citizens on addressing the unintended consequences of growth.



Courtesy of SFWMD

The following statements express Task Force members' agreement on compatibility of the built and natural systems. They are the result of a consensus-building exercise that first listed goals related to ecosystem restoration included in the planning documents of all the participating agencies and many local governments throughout the ecosystem, then synthesized that information into a single list of statements that all the Task Force participants support. 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. Park, open space, and 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 restora-

tion. 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 Statute, Chapter 373, sets goals for water supply that specifically charge water managers to ensure that there is an adequate supply of water for protection of the natural system and existing and future users.

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. Urban, suburban, and rural development utilizes lands that would otherwise be available 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 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 Greater Everglades ecosystem—are important subgoals for fostering compatibility of the built and natural systems. The land use planning, flood control, environmental regulation, and similar activities needed to accomplish these subgoals are primarily the responsibility of the 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. The Task Force members recognizes that these factors affect implementation of the restoration strategy and achievement of its goals.

Efforts to achieve this goal 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 in the implementation of restoration programs and projects. The Task Force and working group see this guiding principle as critical to long-term success and are com-

mitted to ensuring that it is tracked and part of the continuing discussion of their respective work plans.

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 Act and Land Development Regulations, which provide an integrated framework of planning at the state, regional, and local levels. However, growth continues to stress both public infrastructure and the natural environment. 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, the state recently passed a law that addresses growth management, alternative water supply and requires that the comprehensive plans of counties and cities be coordinated with the completed regional water supply plans of the state's water management districts. According to provisions of state law enacted by the 2002 Florida Legislature, local governments are required to coordinate land use planning with the regional water supply plans of the water management districts to ensure the availability of adequate water supplies.

A new initiative by the Florida Department of Community Affairs (DCA) involves the review and analysis of existing and future land use designations adjacent to the acquisition areas and the associated buffers targeted for Everglades restoration. DCA anticipates working with local

governments as they develop the criteria for this review process.

Protection of 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 specifically addressed in this section of the report. 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 2 and indirectly by goal 1, are 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.



Courtesy of SFWMD

The Florida Communities Trust program provides grants to local governments in the state to help implement the natural resource, conservation, coastal, and recreation elements of the statutorily mandated *Local Government Comprehensive Plan*. These grant funds are primarily used for the acquisition of 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 local park and recreation areas under the Florida Recreational Development and Assistance Program.

Linked open space and buffers. Greenways, blueways, and trails multiply the benefits of open spaces to 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.

The Florida Greenways and Trails System is guiding a statewide 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 \$18 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 and grade issues, and urban sprawl. Statewide, 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 Everglades 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 Everglades Agricultural Area (EAA). The program goal of achieving a 25 percent reduction in the phosphorus load from the Everglades Agricultural Area was met the first full year of implementing best management practices. 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 to prevent soil subsidence, and effective stormwater pumping operations. Adjacent to the EAA, a second regulatory program is being implemented for the C-139 basin, and a rulemaking process is being finalized for best management practices north of Lake Okeechobee. In addition, the state has embarked on an aggressive program to establish TMDLs for the Lake Okeechobee watershed, and the SFWMD has implemented a program to clean up nutrient discharges from cattle range and other non-dairy lands north of the lake.

The federal Farm Security and Rural Investment Act (Farm Bill) of 2002 provides several voluntary conservation programs through the U.S. Department of Agriculture (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 Land Protection Program 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 best management practices 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. Implementation of these programs will contribute significantly to the overall Everglades goals and objectives.

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 important act authorizes the responsible agencies to develop strategies to protect rural and 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.

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 kinds of development pressures it is under. The Florida Department of Environmental Protection, Natural Areas Inventory, the University of Florida, Institute of Food and Agricultural Sciences, and the Department of Agriculture and Consumer Services have all been working to implement incentive programs and to collect comprehensive data that will support efforts to retain viable and sustainable agriculture as part of the Greater Everglades ecosystem.

Redevelopment of brownfields. Federal EPA, state, regional, and local programs are contributing to the cleanup and redevelopment of contaminated and abandoned or underused sites in urban core 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 urban areas. This revitalization is expected to lessen development pressure and urban sprawl in areas to the west, needed in order to restore the Everglades ecosystem and 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 EPA in 1998. The EPA also has granted \$2 million to capitalize a brownfields cleanup revolving loan fund, which will be used to assist

in the cleanup and reuse of brownfields in south-east Florida. More than \$1.8 million has been committed by state, regional, local, and private entities for pilot projects through September 2001. The Partnership has also been active in the Florida Brownfields Program, administered and implemented by the Florida Department of Environmental Protection. Miami-Dade County and the Cities of West Palm Beach, Opa-Locka, Miami, Miramar, Pompano Beach, Dania Beach, Miami Beach, and Lauderdale Lakes have designated nineteen sites and areas, totaling 46,978 acres, under the Florida Brownfields Program. This accounts for 71 percent of the acreage designated in Florida as brownfields. The Florida Department of Environmental Protection has delegated the administration and implementation of the Florida Brownfields Program in their respective jurisdictions to Miami-Dade and Broward Counties. This results in streamlining of 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.

Of the approximately 2,100 estimated brown-field sites in the three-county southeast Florida area, some 390 sites have received various levels of environmental assessment review. Approximately 75 sites need no further assessment and will not require remediation. Five sites have undergone remediation activities and are either undergoing redevelopment or will shortly undergo redevelopment. The brownfields program in southwest Florida has one project underway in Fort Myers.

Factors Affecting Achievement of this Subgoal

Unanticipated growth. Accelerated growth in South Florida 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, 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 goal is compatibility, and any efforts that undermine the sustainability of either the built or the natural system could further harm the ecosystem. Potential regulations on agriculture 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. 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 affairs by all segments of the community is critical. 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 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.

Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

- Designate an additional 480,000 acres as part of the Florida Greenways and Trails System by 2008
- Increase participation in the Voluntary Farm Bill conservation programs by 230,000 acres by 2014
- Acquire an additional 2,500 acres of park, recre-

Table 6. Subgoal 3-A: Use and Manage Land in a Manner Compatible with Ecosystem Restoration

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)				
	Target Date	Project	Output		Status
			(additional acres)	(total acres)	(current acres)
Objective 3-A.1: Designate an additional 480,000 acres as part of the Florida Greenways and Trails System by 2008	2008	FDEP & Florida Greenways and Trails Land Aquisition Program	481,975	1,026,102	544,127
Objective 3-A.2: Increase participation in the Voluntary Farm Bill conservation programs by 230,000 acres by 2014	2008	Wetland Reserve Program	27,000		
	2009	Technical Assistance to Indian Reservations	107,000		
	2014	Agriculture Land Stewardship	96,000		
Objective 3-A.3: Acquire an additional 2,500 acres of park, recreation, and open space lands by 2005	2005	Florida Communities Trust Grant Program	2,500		
Objective 3-A.4: Complete five brownfield rehabilitation and redevelopment projects by 2006	2006	Neighborhood Transit Center and Revitalization Project, City of Pompano Beach, H&H Dagam Oil, City of Opa-Locka Konover Site, City of Fort Lauderdale Little Haiti Park Site, City of Miami Oakland Park Abandoned Gun Range Site, City of Oakland Park Liberia Area, City of Hollywood Gravity Entertainment Site, City of Lauderdale Lakes Former Palm Beach Lakes Golf Course, City of West Palm Beach Liberty City Area, Unincorporated Miami-Dade County Potential Pahokee Dump Site, Unincorporated Palm Beach County Imaginarium children's museum site, Fort Myers	Completion of rehabilitation and/or redevelopment of current projects underway each year.		
Objective 3-A.5: Increase community understanding of ecosystem restoration	2004	USDA-NRCS Earth Team Project, in cooperation and coordination with the South Florida Ecosystem Restoration Council Inc. and South Florida Ecosystem Restoration Advisory Committee, will train 1000 volunteers to educate citizens about and how to participate in ecosystem restoration and conserving natural resources.	Trained volunteers		10% complete

ation, and open space lands by 2005

- Complete five brownfield rehabilitation and redevelopment projects by 2006
- Increase community understanding of ecosystem restoration

The key projects needed to achieve these objectives and the schedule for their implementation are shown in table 6.

SUBGOAL 3-B: MAINTAIN OR IMPROVE FLOOD PROTECTION IN A MANNER COMPATIBLE WITH ECOSYSTEM RESTORATION

The SFWMD operates and maintains the primary flood control and water supply system within its sixteen-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 CS&F Project and other projects within the Big Cypress Basin pursuant to regulation schedules and operational guidelines established by the USACE. 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 target 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 Everglades 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 basinwide 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.

Just as environmental protection efforts have the potential to negatively impact flood protection, flood-protection efforts have the potential to negatively impact the health of natural systems. In South Florida, the C&SF Project generally provides flood protection by maintaining pertinent design canal stages and discharging excess water into the ocean. Lowering canal stages not only drains adjacent agricultural and urban lands, but may also affect adjacent natural areas. To make flood-protection efforts compatible with environmental protection, drainage projects need to be

accomplished in a way that does not harm the ecology of protected natural areas while providing flood protection for adjacent lands. Similarly, as provided in the Savings Clause of WRDA 2000, CERP environmental protection projects, including increased canal and groundwater levels, need to be accomplished in a way that does not harm flood protection. The C-111 project will achieve this balance by providing a hydraulic barrier to groundwater seepage from Everglades National Park and rerouting seepage combined with flood flow, previously sent south to Biscayne Bay and Florida Bay, back into the park.

Maintaining flood protection can also impact water supply. The C&SF Project provides flood protection by discharging water into the ocean 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.

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 Canal 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 funded by the Federal Emergency

Management Agency (FEMA), including the C-4 Basin Flood Mitigation Project. This project, which is administered by the SFWMD, will improve canals in the C-4 basin and provide 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 has 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. 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

Table 7. Subgoal 3-B: Maintain or Improve Flood Protection in a Manner Compatible with Ecosystem Restoration

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)		
	Target Date	Project	Status
Objective 3-B.1: Maintain or improve existing levels of flood protection	2005	C-111 Canal project	Flood protection at 1 in 10-year level Underway
	2004	C-4 Basin Flood Mitigation Project	Flood protection at 1 in 10-year level Underway

basin of the C&SF Project will 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

The objective established for achieving this subgoal is

- Maintain or improve existing levels of flood protection

The key projects needed to achieve this objective and the schedule for their implementation are shown in table 7.

SUBGOAL 3-C: PROVIDE SUFFICIENT WATER RESOURCES FOR BUILT AND NATURAL SYSTEMS

The State of Florida has statutory goals for water supply that specifically charge water managers to ensure an adequate supply of water for protection of the natural system and the needs of the population. The goal associated with the water supply needs of the population is to meet the needs of existing and future "reasonable-beneficial" uses under conditions up to and including a one-in-ten-year drought event, while committing appropriate water resource reservations for the natural system needs as outlined in WRDA 2000 (see Appendix A).

An additional protection for existing water uses is provided in the federal statute, WRDA 2000, through the Savings Clause, which specifically says that existing water sources will not be eliminated or transferred from an existing legal user of water until a new source of water supply of comparable quantity and quality is available to replace water that would be lost as a result of implementation of the CERP.

How This Subgoal Will Be Implemented

As water storage and other water supply related projects and programs are implemented (see subgoal 1-A), reliable sources of water will become available to meet target levels of service 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 goals and subgoals (for example, planning for growth is addressed under subgoal 3-A). Efforts unique to this subgoal are described below.

Develop a process of reserving water through time that will meet the needs of the natural system. In a January 2002 agreement with the federal government, Governor Jeb Bush pledged that the State of Florida would reserve the water generated by the CERP and needed for Everglades restoration, as required by WRDA 2000. Currently the SFWMD, consistent with its water management responsibilities, is working hard to fulfill that commitment. The SFWMD is

developing a process to undertake water reservations which is scheduled to be completed by the end of 2002.

Implement the State Water Conservation Plan. The FDEP has recently drafted a *State Water Conservation Plan*. This comprehensive document was developed with input from all the various user groups throughout the state. The FDEP continues to refine this plan and develop strategies for implementation. The SFWMD is developing a rule that will implement some of the recommendations in this plan and assist water managers in improving the ability to meet water demands in times of flood and drought.

The Water Conservation Rule will evaluate water conservation and its practice by user groups, and consider establishing a water conservation ethic geared toward performance. The rule will assist the SFWMD in achieving conservation benefits through public outreach, cooperative grant funding, and technical assistance.

The Water Shortage Rule will update existing rules that were found inefficient during past

water shortages with new recommendations for improving water efficiencies during drought periods. It will improve standardizing procedures and address new user groups whose needs were not reflected in the past rules.

Implement 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 the available water supply, (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 ground water or other available water supplies in plans for future growth and development, (5) increasing supply through water resource development projects, and (6) protecting natural systems from harm through the consump-

Table 8. Subgoal 3-C: Provide Sufficient Water Resources for Built and Natural Systems

Objective	Milestone Projects (Refer to the Project Summary Table for more information about specific project schedules, funding, responsible agencies, etc.)				
	Target Date	Project	Output (mgd)	Status	
Objective 3-C.1: Increase regional water supply by 397 million gallons per day by 2005	2005	LEC Water Supply Plan	143.2	Underway	
	2005	LWC Water Supply Plan	151.0		
	2005	UEC Water Supply Plan	40.9		
	2005	Kissimmee Basin Supply Plan	62.0		
Objective 3-C.2: Increase volume of reuse on a regional basis	Target Date	Project	Output (mgd)	Status	
		C&SF: CERP – South Miami-Dade County Reuse	131		
		C&SF: CERP – West Miami-Dade County Reuse	100		Underway
		Lower West Coast Regional Irrigation Distribution System Master Plan Study	TBD		
		Northern Palm Beach County and Southern Martin County Reclaimed Water Master Plan	TBD		
		Orlando Kissimmee Area Regional Reclaimed Water Optimization Plan	TBD		
Objective 3-C.3: Achieve annual targets for water made available through SFWMD alternative water supply program	Target Date	Project	Output (mgd)	Status	
		2002	Alternative Water Supply Grant Program		50
Objective 3-C.4: Reduce water consumption for irrigation 13,800 acre-feet by 2004	Target Date	Project	Output (acre-feet)	Status	
	2004	Mobile Irrigation Lab	13,800		

tive 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, 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 FDEP 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, the supply of water currently being

planned for will not be adequate. Therefore, variations in growth projections are incorporated into five-year updates to 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.

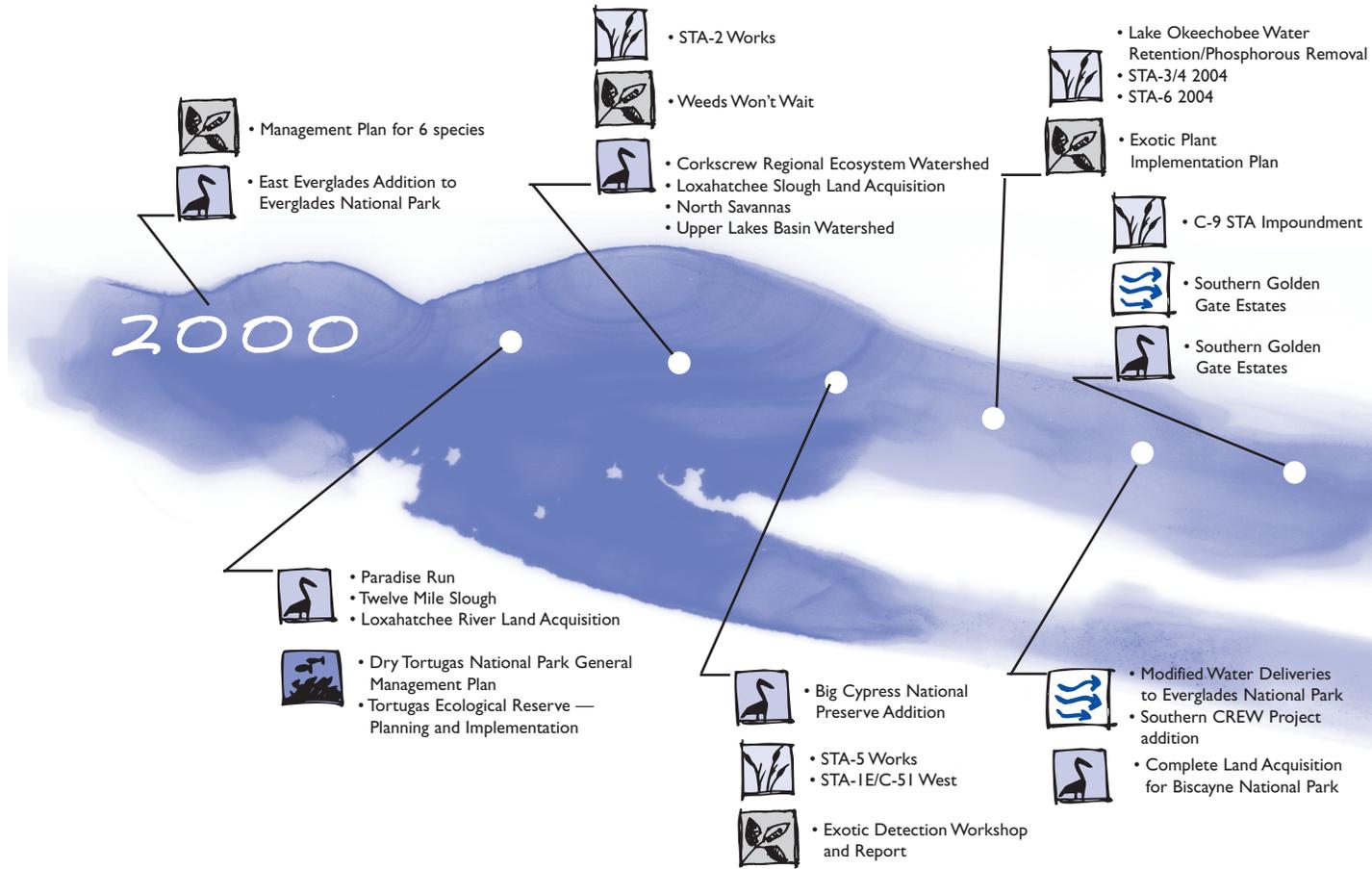
Specific, Measurable Objectives for Achieving this Subgoal

The objectives established for achieving this subgoal are

- Increase regional water supply by 397 million gallons per day by 2005
- Increase volume of reuse on a regional basis
- Achieve annual targets for water made available through the SFWMD Alternative Water Supply Development Program
- Reduce water consumption for irrigation 13,800 acre-feet by 2004

The key projects needed to achieve these objectives and the schedule for their implementation are shown in table 8. The outputs listed in table 8 and the measures and targets in the Project Summary Table reflect strategy goals and are not intended to function as an allocation or reservation of water, which must be implemented through applicable law.

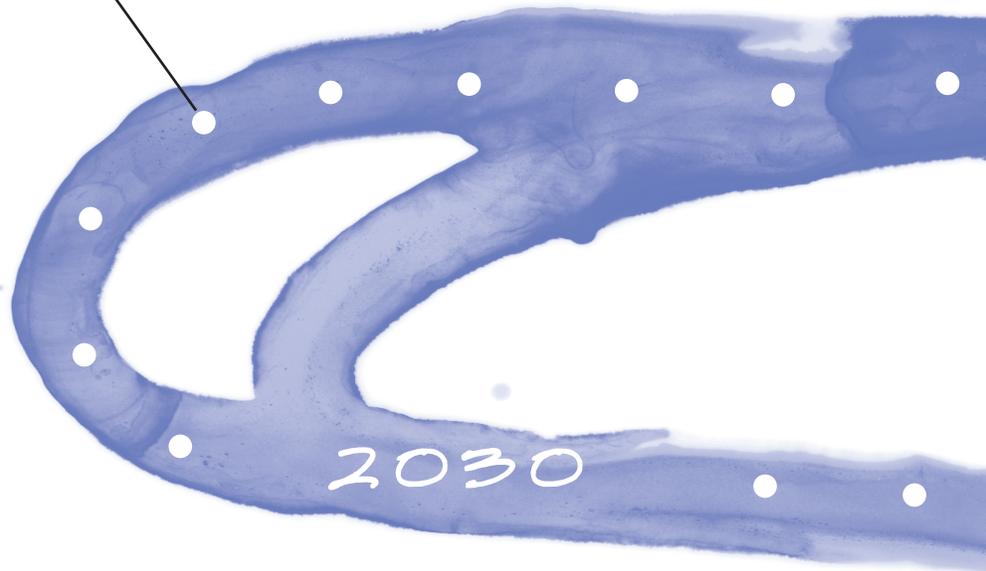
TIMELINE FOR SOUTH FLORIDA RESTORATION

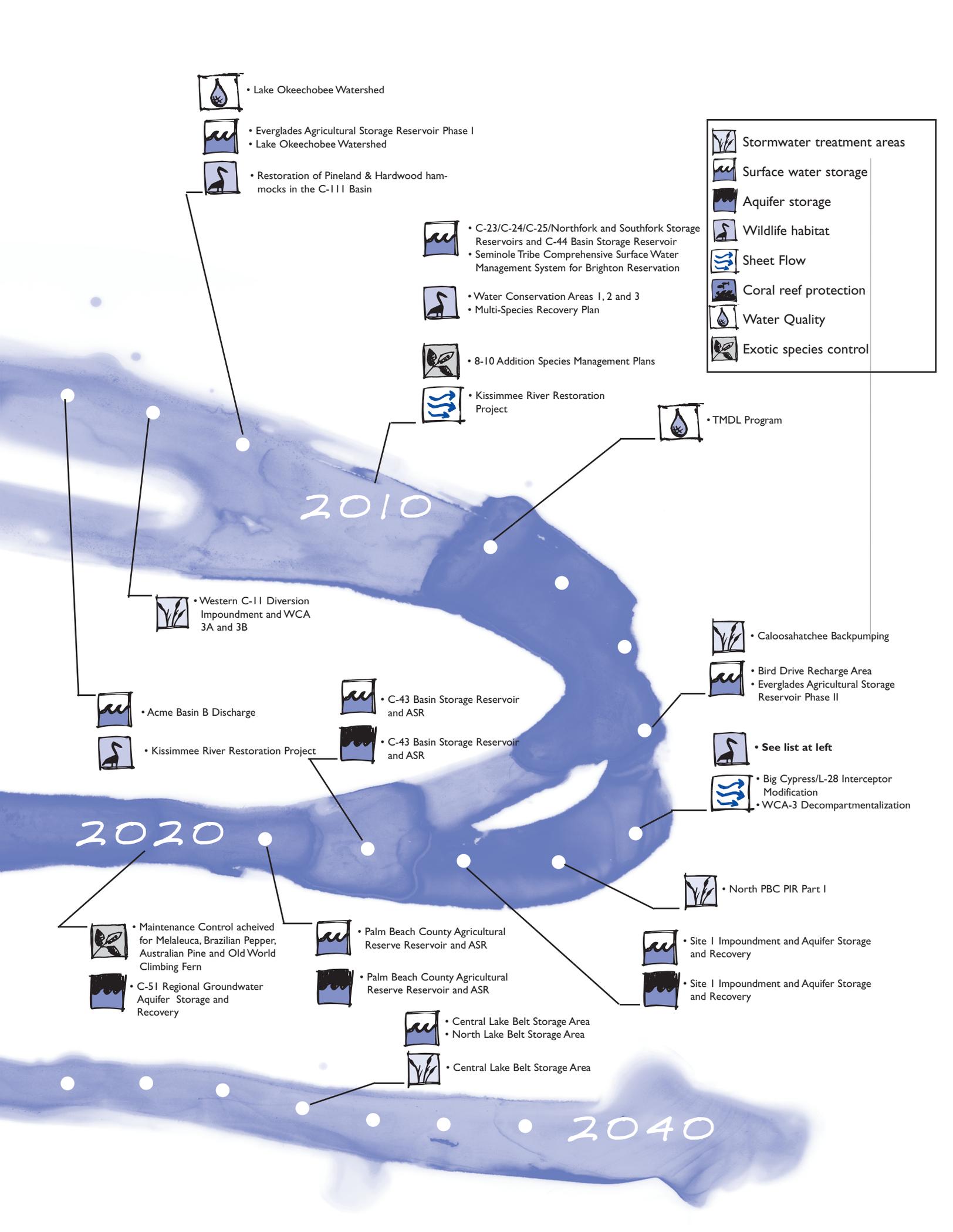


- Allapattah Flats/Ranch
- Atlantic Ridge Ecosystem
- Barfield Farms
- Belle Meade
- Caloosahatchee Ecoscape
- Catfish Creek
- Cayo Costa
- Charlotte Harbor Flatwoods
- Corkscrew Regional Ecosystem Watershed
- Coupon Bight/ Key Deer Big Pine Key
- Cypress Creek/Trail Ridge
- Estero Bay
- Fakahatchee Strand
- Fisheating Creek
- Florida Keys Ecosystem
- Indian River Lagoon Blueway
- Juno Hills
- Lake Wales Ridge Ecosystem
- Lake Walk-In-Water
- North Fork St Lucie River
- North Key Largo Hammocks
- Okaloacoochee Slough
- Osceola Pine Savannas
- Pal-Mar
- Pineland Site Complex
- Rookery Bay
- Rotenberger/Holey Land Tract
- Six Mile Cypress
- South Savannas



• Lake Okeechobee Aquifer Storage and Recovery





- Lake Okeechobee Watershed

- Everglades Agricultural Storage Reservoir Phase I
- Lake Okeechobee Watershed

- Restoration of Pineland & Hardwood hammocks in the C-111 Basin

- C-23/C-24/C-25/Northfork and Southfork Storage Reservoirs and C-44 Basin Storage Reservoir
- Seminole Tribe Comprehensive Surface Water Management System for Brighton Reservation

- Water Conservation Areas 1, 2 and 3
- Multi-Species Recovery Plan

- 8-10 Addition Species Management Plans

- Kissimmee River Restoration Project

- TMDL Program

- Western C-11 Diversion Impoundment and WCA 3A and 3B

- Acme Basin B Discharge

- Kissimmee River Restoration Project

- C-43 Basin Storage Reservoir and ASR

- C-43 Basin Storage Reservoir and ASR

- Caloosahatchee Backpumping

- Bird Drive Recharge Area
- Everglades Agricultural Storage Reservoir Phase II

- See list at left

- Big Cypress/L-28 Interceptor Modification
- WCA-3 Decompartmentalization

2020

- Maintenance Control achieved for Melaleuca, Brazilian Pepper, Australian Pine and Old World Climbing Fern

- C-51 Regional Groundwater Aquifer Storage and Recovery

- Palm Beach County Agricultural Reserve Reservoir and ASR

- Palm Beach County Agricultural Reserve Reservoir and ASR

- North PBC PIR Part I

- Site I Impoundment and Aquifer Storage and Recovery

- Site I Impoundment and Aquifer Storage and Recovery

- Central Lake Belt Storage Area
- North Lake Belt Storage Area

- Central Lake Belt Storage Area

2040

- Stormwater treatment areas
- Surface water storage
- Aquifer storage
- Wildlife habitat
- Sheet Flow
- Coral reef protection
- Water Quality
- Exotic species control

Linkages Between 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 improvements in the ecosystem. With these two scales the Task Force distinguishes between those things that are within people's capability to manipulate and control (the work goals, subgoals, and objectives) and those things that are the responses of natural systems to their surroundings (the indicators of ecosystem health).

In setting the measurable targets for the various aspects of ecosystem health, the Task Force members assessed the major stressors on the various components of the ecosystem and considered when the projects designed to eliminate or mitigate those stressors are scheduled for completion. The Task Force assumes that the natural system will respond with improved health and vigor to efforts to reverse disruptive human influences. The monitoring and evaluations that have been conducted to date support this assumption. For example, wetland vegetation, particularly broadleaf marsh species and buttonbush, is rapidly expanding on the reflooded floodplain in

response to the reestablishment of more natural flow characteristics in the Kissimmee River. 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 a peregrine falcon, a roseate spoonbill, and a whooping crane. This is one localized and general example of how the ecosystem is slowly responding to work efforts to eliminate or mitigate disruptive human influences.

Generally there is no exclusive linkage between any one work goal or objective and any one indicator of ecosystem health. Efforts on many fronts will be necessary to restore and sustain a healthy ecosystem, which will then be manifested through myriad species and processes. However, positive correlations are expected between individual indicators and groups of projects designed to restore conditions that are beneficial to that indicator. Some of these relationships are charted in table 9, below.

Table 9. Linkages Between Work Efforts and Ecosystem Restoration

MEASURES OF ECOSYSTEM HEALTH		LINKAGES		MEASURES OF WORK EFFORTS	
Indicator	Measurable Target	Stressor	Restoration Action	Major Projects Related To Eliminating/Mitigating Stressor	Objective
Total System: Threatened and endangered species	Improved status for fourteen federally listed T&E species, and no declines in status for those additional species listed by the state, by 2020.	Loss, degradation, and fragmentation of habitat	Acquisition and restoration of critical habitat lands, including linkage corridors, along with restoration of more natural hydrologic functions in wetlands and maintenance control of invasive exotic species, is expected to halt declines in species status and lead to the recovery of healthy populations.	All habitat protection land acquisition projects 1994: South Florida Multi-Species Recovery Plan	2-A.1 2-A.4
Total System: Nesting wading birds	Target: Recover, at a minimum, an annual average of 10,000 nesting pairs of great egrets, 15,000 pairs of snowy egrets and tricolored herons combined, 25,000 pairs of white ibis, and 5,000 pairs of wood storks.	Disruptions to traditional nesting patterns caused by reduced water flows into the estuaries, which were traditionally the richest rookery sites, substantial reductions in the total area of wetlands throughout the ecosystem, and the creation of unnatural water impoundments in the Everglades	Restoring the location, timing, and volumes of water flows; particularly the flows to the estuaries, is expected to result in more traditional nesting patterns, improved reproductive success, and recovered larger populations of nesting wading birds.	2006: Modified Waters Delivery Project ¹ 2008: C-111 N Spreader Canal 2009: Everglades Agricultural Area Storage Reservoir, phase 1 2010: L31N Seepage Management 2015: Everglades Agricultural Area Storage Reservoir, phase 2 2019: WCA-3 Decompartmentalization 2020: Lake Okeechobee Aquifer Storage and Recovery 2036: Central Lake Belt Storage Area Everglades Rainfall-driven Operations	1-A.3 1-A.3 1-A.1 NA 1-A.1 1-A.3 1-A.2 1-A.1 NA
Total System: Urban and Agricultural Water Supply	Target: Water provided to all users during droughts up to the level of severity of a one-in-ten-year frequency of occurrence	Loss of freshwater through discharge and seepage Inefficiencies in water supply and consumption	Surface storage reservoirs, aquifer storage and recovery, and seepage management projects are expected to recapture the water that is currently lost to the ecosystem through unnatural discharges.	Reservoir and ASR projects 2005: LEC Water Supply Plan 2005: LWC Water Supply Plan 2005: UEC Water Supply Plan 2005: Kissimmee Basin Supply Plan C&SF: CERP – South Miami-Dade County Reuse C&SF: CERP – West Miami-Dade County Reuse Lower West Coast Regional Irrigation Distribution System Master Plan Study Northern Palm Beach County and Southern Martin County Reclaimed Water Master Plan Orlando Kissimmee Area Regional Reclaimed Water Optimization Plan 2002: Alternative Water Supply Grant Program	1-A.1 3-C.1 3-C.1 3-C.1 3-C.1 3-C.2 3-C.2 3-C.2 3-C.2 3-C.2 3-C.2 3-C.2 3-C.2 3-C.3

¹ Congress specifically emphasized the importance of completing the Modified Water Delivery Project in the 2000 Water Resources Development Act. In the conditions section of 603 Congress said “No appropriation shall be made to construct the Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project “(…list of specific components within that project…)” or the Central Lakebelt Storage Project (including components S and EEE, Central Lake Belt Storage Area) until the completion of the project to improve water deliveries to Everglades National Park authorized by section 104 of the Everglades National Park Protection and Expansion Act of 1989.”

Table 9. Linkages Between Work Efforts and Ecosystem Restoration Continued

MEASURES OF ECOSYSTEM HEALTH		LINKAGES		LINKAGES		MEASURES OF WORK EFFORTS	
Indicator	Measurable Target	Stressor	Restoration Action	Stressor	Restoration Action	Major Projects Related To Eliminating/Mitigating Stressor	Objective
Estuaries: Oyster beds in the St. Lucie Estuary	Approximately 900 acres of healthy oyster beds.	Unnatural changes in water salinity caused by excessive freshwater flows into the estuary, also changes in water quality caused by discharges of unnaturally nutrient-laden waters	Storage projects and projects that will remove barriers to sheet flow, thus curtailing the unnatural discharges of nutrient laden freshwater into the estuary, are expected to create conditions for oyster recolonization of areas with a suitable substrate.			1997: Kissimmee Prairie Ecosystem 2002: East WCA-3A Hydropattern Restoration 2003: Modified Waters Delivery Project 2006: Florida Keys Tidal Restoration 2005: Canal 111 - North Spreader 2009: Kissimmee River Restoration 2015: WCA-3 Decompartmentalization and Sheetflow Enhancement	I-A.3 I-A.3 I-A.3 I-A.3 I-A.3 I-A.3
Estuaries: Roseate spoonbills	At least 1,000 nesting pairs throughout Florida Bay, and some nesting pairs in the coastal zone of the southwestern gulf coast	Declines in the productivity of estuarine feeding grounds caused by too little freshwater entering the estuaries	Projects that will restore more natural flow volumes and patterns of freshwater entering the Florida Bay and gulf coast estuaries are expected to improve the productivity of feeding grounds used by roseate spoonbills and lead to population increases for this species.			2005: Florida Bay and the Florida Keys Feasibility Study	I-A.4
Lake Okeechobee: Submerged Aquatic Vegetation	Sustain at least 40,000 acres of healthy submerged aquatic vegetation around the shoreline of Lake Okeechobee on an ongoing basis	Unnaturally frequent and prolonged high water levels in the lake	Major surface water and aquifer storage projects in the Lake Okeechobee watershed, along with the watershed water quality treatment project, are expected to result in lower lake levels and to significantly improve the long-term survival of large beds of submerged aquatic vegetation.			2007: C-44 Basin Storage Reservoir 2009: Lake Okeechobee ASR Pilot Project 2009: Everglades Agricultural Area Storage Reservoir, Phase I 2010: Lake Okeechobee Watershed Water Quality Treatment Facilities 2012: C-43 Basin Storage, Phase I 2015: Everglades Agricultural Area Storage Reservoir, Phase 2 2020: Lake Okeechobee Aquifer Storage and Recovery	I-A.1 I-A.2 I-A.1 I-B.1 I-A.1 I-A.1 I-A.1 I-A.2
Everglades Ridge and Slough: Tree Islands	Target: No further degradation of tree islands, and recovery of as much as possible of the number and acreage of the islands present in WCA-2 and WCA-3 in 1940.	Unnaturally frequent and prolonged flooding of tree islands Unnaturally frequent intense fires	Major surface water and aquifer storage projects upstream from the Everglades, along with removal of impediments to water flow through the Everglades, are expected to reduce unnatural flooding of tree islands.			2009: Everglades Agricultural Area Storage Reservoir, Phase I 2010: L31N Seepage Management 2015: Everglades Agricultural Area Storage Reservoir, Phase 2 2019: WCA-3 Decompartmentalization 2020: Lake Okeechobee Aquifer Storage and Recovery 2036: Central Lake Belt Storage Area Everglades Rainfall-driven Operations	I-A.1 NA I-A.1 I-A.1 I-A.3 I-A.2 I-A.1 NA

Table 9. Linkages Between Work Efforts and Ecosystem Restoration Continued

MEASURES OF ECOSYSTEM HEALTH		LINKAGES		MEASURES OF WORK EFFORTS	
Indicator	Measurable Target	Stressor	Restoration Action	Major Projects Related To Eliminating/Mitigating Stressor	Objective
Florida Bay: Seagrass beds	A 65-70 percent coverage of Florida Bay with high-quality seagrass beds	Disruptions of natural volume and timing of freshwater flows into the southern estuaries	Projects that increase freshwater flows into the bay, such as the projects to improve water management practices in the C-111 and Taylor Slough basin, are expected to improve conditions for seagrass beds.	2009: Everglades Agricultural Area Storage Reservoir, phase 1 2010: L31N Seepage Management 2015: Everglades Agricultural Area Storage Reservoir, phase 2 2019: WCA-3 Decompartmentalization 2020: Lake Okeechobee Aquifer Storage and Recovery 2036: Central Lake Belt Storage Area Everglades Rainfall-driven Operations	I-A.1 NA I-A.1 I-A.3 I-A.2 I-A.1 NA
Florida Bay: Commercial harvest rates for pink shrimp	A long-term average rate of commercial harvest of pink shrimp on the Dry Tortugas fishing grounds that equals or exceeds 600 pounds per vessel-day, and an amount of large shrimp in the long-term average catch exceeding 500 pounds per vessel	Disruptions of natural volume and timing of freshwater flows into the southern estuaries	Restoration of flows that more closely match natural hydrological patterns should benefit the Tortugas pink shrimp fishery.	2005: Florida Bay and the Florida Keys Feasibility Study	I-A.4

Overview of Major Programs and Costs

The Conference Committee Report language accompanying the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 2000, Public Law 106-113, requested that the department submit information, to be updated biennially, on the total cost of the effort to restore the South Florida ecosystem. In relevant part, the report language states:

"It would be useful to have a complete estimate of the total costs to restore the South Florida ecosystem. The House and Senate Committees on Appropriations believe that this new estimate will exceed the \$7,800,000,000 estimate that has been used over the last five years. This recalculated estimate should include all three goals of this initiative, namely, (1) getting the water right, (2) restoring and enhancing the natural habitat, and (3) transforming the built environment. The Congress and the American people are committed to this project. Over \$1,300,000,000 has been appropriated to date, however, and the public deserves to know how much this project will truly cost. This information should be submitted to the House and Senate Committees on appropriations no later than February 1, 2000 and should be updated biennially."

The best estimate for the total cost to restore the South Florida ecosystem continues to be \$14.8 billion, as reported by the Department of the Interior in a letter to Congress dated March 8, 2000 (see appendix C). Of the total restoration cost \$7.8 billion represents the cost of implementing the CERP, which will be shared equally by the federal government and nonfederal sponsors. The CERP outlines sixty-eight components that will take more than thirty years to construct. The CERP was approved by Congress in WRDA 2000, and is integral to achieving two of the three goals of restoration: get the water right (restore more natural flows to the ecosystem while guaranteeing regional water supplies and flood control), and restore, preserve, and protect natural habitats and species. Because ongoing congressional authorization is required for the proposed projects included in the CERP, and because individual projects must undergo additional site-specific stud-

ies and analyses, the overall cost to implement this significant component of the restoration effort could be lower or higher depending upon future analyses and site-specific studies.

The CERP builds on other plans and projects that were authorized by Congress and the Florida Legislature prior to and independent of the CERP. These include the Everglades Construction Project; the C-111 Project; the Modified Water Deliveries to Everglades National Park Project; the Kissimmee River Restoration Project; a number of smaller "Critical Projects" authorized by WRDA 1996; the MSRP; state water quality plans; the Florida Forever programs, which include a variety of conservation, recreation, and water resource land acquisition programs; and federal land acquisitions for national parks, preserves, and wildlife refuges. Taken together these projects represent an additional \$7 billion investment. The costs for these measures have been included in the total cost of ecosystem restoration because they actively promote overall restoration goals and establish the baseline conditions for the CERP. Table 10 is a tracking matrix which identifies individual projects, responsible agencies, targets, and costs.

The projections and project schedules in this report span multiple decades and depend on certain assumptions about state and federal budget requests and funding levels, optimized construction schedules, willing sellers, and other contingencies. These assumptions are likely to change as the project progresses, and appropriate revisions to this document will be necessary. Therefore, this document does not represent a commitment by the federal, state, or local governments or the tribes to seek appropriations for specific projects and activities at the funding levels laid out in this document.

State and federal agencies have already acquired 4.9 million acres of land for ecosystem restoration purposes. As of September 2001 the state had acquired 3.5 million acres of habitat conservation land in South Florida at a cost of over \$1.5 billion.

Project Summary Table

This section of the report provides detailed information about the restoration projects that contribute to the accomplishment of the vision, goals, subgoals, and objectives described earlier in this document. Table 10 provides a summary listing of projects with information about schedule, cost, and the goals addressed by each project.

Individual agencies have identified and provided these projects. The Task Force has not independently evaluated or endorsed any project.

Detailed information data sheets, which are included in appendix F in volume 2 of this report, provide further information for each of these projects, including:

- *PROJECT NAME*
- *UNIQUE TASK FORCE PROJECT IDENTIFICATION NUMBER*
- *LEAD AGENCY*
- *AUTHORITY*
- *GOAL(S) ADDRESSED*
- *MEASURABLE OUTPUT(S)*
- *COST*
- *PROJECT SCHEDULE*
- *PROJECT SYNOPSIS*
- *DETAILED PROJECT BUDGET INFORMATION*
- *HYPERLINK OR A POINT OF CONTACT FOR MORE DETAILED PROJECT INFORMATION*

TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg. #
Goal 1.	GET THE WATER RIGHT									
Sub-Goal 1.A.	GET THE HYDROLOGY RIGHT (Quantity, Timing & Distribution)									
I.A.1.	SURFACE WATER STORAGE PROJECTS									
	1100 C&SF: CERP Acme Basin B Discharge	USACE	2002	2007	\$70,100,000	\$242,000	ACRE-FT. 3,800	I.A.1		1
	1101 C&SF: CERP Indian River Lagoon, South, C-23/C-24/C-25/Norfolk and Norfolk Storage Reservoirs (UU), and C&SF: CERP C-44 Basin Storage Reservoir (B)	USACE/SFWM	1999	2010	\$995,935,000	\$841,348,000	190,000	I.A.1		2
	1102 C&SF: CERP Everglades Agricultural Storage Reservoir Phase I	USACE/SFWM	2001	2009	\$233,408,000	\$7,184,000	240,000	I.A.1		3
	1103 C&SF: CERP Everglades Agricultural Storage Reservoir Phase II (GP2)	USACE/SFWM	2004	2014	\$203,240,000	\$356,000	20,000	I.A.1		4
	1104 C&SF: CERP Lake Okeechobee Watershed	USACE/SFWM	2000	2009	\$455,827,000	\$1,618,700	250,000	I.A.1	I.B.1, 2.A.3	5
	1105 C&SF: CERP North Lake Belt Storage Area (Phase I & II)	USACE/SFWM	2011	2036	\$500,346,000	\$902,000	90,000	I.A.1		7
	1106 C&SF: CERP Palm Beach County Agricultural Reserve Reservoir and ASR	USACE/SFWM	2005	2019	\$121,359,000	\$216,000	20,000	I.A.1	I.A.2	8
	1107 C&SF: CERP Site I Impoundment and Aquifer Storage and Recovery	USACE/SFWM	2002	2017	\$131,379,000	\$430,000	15,000	I.A.1	I.A.2	9
	1108 C&SF: CERP C-43 Basin Storage Reservoir and ASR	USACE/SFWM	2001	2018	\$440,195,000	\$5,376,000	160,000	I.A.1	I.A.2	12
	1109 C&SF: CERP Central Lake Belt Storage Area	USACE/SFWM	2011	2036	\$466,725,000	\$844,000	190,000	I.A.1	I.B.1, 1.3	13
	1110 C&SF: CERP Critical Ecosystems Restoration Projects - Ten Mile Creek	USACE/SFWM	1997	2003	\$29,946,000	\$9,626,000	5,000	I.A.1	2.A.3	14
	2100 Allapattah Flats/Ranch	FDEP	1997	TBD	*	\$32,000	32,000	2.A.1	I.A.1	99
I.A.2.	AQUIFER STORAGE & RECOVERY (ASR) PROJECTS									
	1109 C&SF: CERP C-43 Basin Storage Reservoir and ASR	USACE/SFWM	2001	2018	*		BGD	I.A.1	I.A.2	12
	1200 C&SF: CERP C-51 Regional Groundwater Aquifer Storage and Recovery	USACE/SFWM	2009	2020	\$127,391,000	\$328,000	0.17	I.A.2		15
	1201 C&SF: CERP Lake Okeechobee ASR (GG)	USACE/SFWM	2009	2026	\$1,097,312,000	\$1,918,000	1	I.A.2		16
	1106 C&SF: CERP Palm Beach County Agricultural Reserve Reservoir and ASR	USACE/SFWM	2005	2019	*		0.075	I.A.1	I.A.2	8
	1107 C&SF: CERP Site I Impoundment and Aquifer Storage and Recovery	USACE/SFWM	2002	2017	*		0.15	I.A.1	I.A.2	9
I.A.3.	MODIFY IMPEDIMENTS TO SHEETFLOW PROJECTS									
	1300 Canal 111	USACE/SFWM	1994	2005	\$268,200,000	\$100,062,000	4	I.A.3	3.B.1	17
	1301 C&SF: CERP WCA-3 Decompartimentalization and Sheetflow Enhancement (AA)(QQ)(SS)	USACE/SFWM	2001	2015	\$211,687,000	\$936,000	240	I.A.3	2.A.3	18
	1302 C&SF: CERP Florida Keys Tidal Restoration	USACE/SFWM	2001	2006	\$1,251,000	\$990,000	0.6	I.A.3		19
	1303 Critical Projects Southern CREW	USACE	1999	2005	\$3,435,000	\$448,000		I.A.3		20
	1304 East WCA-3A Hydropattern Restoration	SFWM	1994	2002	\$8,360,631	\$5,171,631	8.5	I.A.3		21
	1305 Kissimmee Prairie	FDEP/SFWM	1996	1997	\$21,953,796	\$21,953,796	39.3	I.A.3	2.A.1	22
	1306 Kissimmee River Restoration Project	USACE/SFWM	1994	2010	\$578,000,000	\$201,970,000	22	I.A.3	2.A.3	23
	1307 Modified Water Deliveries to Everglades National Park	NPS	1990	2005	\$190,890,000	\$160,162,000	21	I.A.3	2.A.4	24
I.A.4.	OTHER RELATED HYDROLOGY PROJECTS									
	1400 Additional Water Conveyance Structures Under Tamiami Trail	FDOT	1998	2005	\$18,398,000	\$1,773,000		I.A.4		25
	1401 Biscayne Bay Feasibility Study	USACE/PH/DADE	1996	2001	\$6,370,000	\$2,374,000		I.A.4		26
	1402 C&SF: CERP Water Preserve Areas (WPA) Feasibility Study	USACE/SFWM	1996	2002	\$19,955,000	\$19,955,000		I.A.4		27
	1403 C&SF: CERP Broward County Secondary Canal System	USACE/SFWM	2001	2009	\$12,898,000	\$2,500,000		I.A.4		28
	1404 C&SF: CERP C-111IN Spreader Canal	USACE/SFWM	2000	2009	\$94,035,000	\$1,868,000		I.A.4		29
	1405 C&SF: CERP Dade-Broward Levee/Pensacola Wetlands (BB)	USACE/SFWM	2002	2009	\$18,778,000	\$2,326,000		I.A.4		30
	1406 C&SF: CERP East Coast Canal Structures (C-4)	USACE/SFWM	1999	2002	\$3,421,000	\$3,421,000		I.A.4		31
	1407 C&SF: CERP Lake Istokopga Regulation Schedule (ORF)	USACE/SFWM	2002	2003	\$50,000	\$44,000		I.A.4		32
	1408 C&SF: CERP Loxahatchee National Wildlife Refuge Internal Canal Structures	USACE/SFWM	2003	2007	\$7,662,000	\$14,000		I.A.4		33
	1503 C&SF: CERP North Palm Beach County PIR Part I	USACE/SFWM	2001	2016	*			I.B.1	I.A.4	63
	1409 C&SF: CERP Seminole Tribe Big Cypress Water Conservation Plan	USACE & Seminole	2001	2008	\$75,288,000	\$4,765,000		I.A.4		34

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TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE CONTINUED

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg. #
	1410 C&SF: CERP Biscayne Bay Coastal Wetlands	USACE/SFWM	1999	2015	\$299,583,000	\$1,168,000		I.A.4		35
	1411 C&SF: CERP Caloosahatchee R. (C-43) Basin ASR Pilot Project	USACE/SFWM	2001	2008	\$6,000,000	\$350,000		I.A.4		36
	1412 C&SF: CERP Diverting WCA-2 and WCA-3 Flows to Central Lake Belt Storage Area	USACE/SFWM	2009	2018	\$76,921,000	\$150,000		I.A.4		37
	1413 C&SF: CERP Everglades Rain Driven Operations	USACE/SFWM	TBD	TBD	TBD	\$0		I.A.4		38
	1414 C&SF: CERP Henderson Creek/Belle Meade Restoration	USACE/SFWM	2000	2005	\$4,800,000	\$246,000		I.A.4	I.B.1	39
	1415 C&SF: CERP L-31 N Improvements for Seepage Management and S-356 Structures	USACE/SFWM	2006	2013	\$184,845,000	\$322,000		I.A.4		40
	1416 C&SF: CERP L-31 N Seepage Management Pilot Project	USACE/SFWM	2001	2006	\$10,000,000	\$1,630,000		I.A.4		41
	1417 C&SF: CERP Lake Belt (In-Ground Reservoir) Technology - Pilot Project	USACE/SFWM	1999	2011	\$23,000,000	\$2,432,000		I.A.4		42
	1418 C&SF: CERP Lake Okeechobee Aquifer Storage and Recovery Pilot Project	USACE/SFWM	1999	2009	\$19,000,000	\$3,638,000		I.A.4		43
	1419 C&SF: CERP Lake Okeechobee Regulation Schedule	USACE/SFWM	TBD	TBD	TBD	\$0		I.A.4		44
	1420 C&SF: CERP Modified Holeyland Wildlife Management Area Operation Plan	USACE/SFWM	2003	2008	\$150,000	\$0		I.A.4		45
	1421 C&SF: CERP Modified Rotenberg Wildlife Management Area Operation Plan	USACE/SFWM	2003	2006	\$150,000	\$0		I.A.4		46
	1422 C&SF: CERP Operational Modification to Southern Portion of L-31N and C-111	USACE/SFWM	TBD	TBD	TBD	\$0		I.A.4		47
	1423 C&SF: CERP Site 1 Impoundment and Aquifer Storage and Recovery Pilot Project	USACE/SFWM	1999	2009	\$9,000,000	\$2,194,000		I.A.4		48
	1424 C&SF: CERP Southern Golden Gates Estates Restoration	USACE/SFWM	1999	2006	\$45,654,000	\$5,266,000		I.A.4		49
	1425 Critical Projects Seminole Big Cypress Reservation Water Conservation Plan	Seminoles & USACE	1997	2008	\$57,558,938	\$6,598,822		I.A.4		50
	1426 Florida Bay and The Florida Keys Feasibility Study	USACE	2000	2005	\$4,569,000	\$2,478,000		I.A.4		52
	1427 Herbert Hoover Dike Stabilization	USACE/SFWM	2001	2008	\$234,400,000	\$5,380,000		I.A.4		53
	1428 Indian River Lagoon Restoration Feasibility Study	USACE/SFWM	1996	2002	\$6,150,000	\$6,150,000		I.A.4		54
	1429 Northern L-8 Basin Improvements	SFWM	1994	2006	\$25,277	\$25,277		I.A.4		55
	1430 Rotenberg Restoration	SFWM	1994	2000	\$5,031,101	\$3,387,101		I.A.4		56
	1431 Southwest Florida Feasibility Study	USACE	1999	2005	\$12,000,000	\$3,724,000		I.A.4		57
	1432 WCA-2A Hydropattern Restoration	SFWM	1994	2001	\$5,895,440	\$5,553,440		I.A.4		58
	1433 West WCA-3A Hydropattern Restoration	SFWM	1994	2006	\$10,909,917	\$7,122,799		I.A.4		59
Sub-Goal 1.B	GET THE WATER QUALITY RIGHT									
I.B.1.	STORMWATER TREATMENT AREA (STA) PROJECTS						ACRES			
	1104 C&SF: CERP Lake Okeechobee Watershed	USACE/SFWM	2000	2009	*	*	11,875	I.A.1	I.B.1	5
	1500 C&SF: CERP Big Cypress/J-28 Interceptor Modifications (CCC)	USACE/SFWM	2005	2015	\$42,751,000	\$74,000	1,900	I.B.1		60
	1501 C&SF: CERP C-9 STA and Impoundment	USACE/SFWM	2002	2006	\$89,146,000	\$32,369,000	2500	I.B.1		61
	1502 C&SF: CERP Miccosukee Tribe Water Management Plan	USACE & Miccosukee	2003	2010	\$24,459,000	\$0	see page 68	I.B.1		62
	1503 C&SF: CERP North Palm Beach County PIR Part 1	USACE/SFWM	2001	2016	\$393,678,000	\$3,188,400	1,260	I.B.1	I.A.4	63
	1504 Seepage Management	USACE/SFWM	2002	2008	\$224,544,000	\$824,000	1,600	I.B.1		65
	1505 C&SF: CERP Caloosahatchee Backpumping with Stormwater Treatment	USACE/SFWM	2005	2014	\$82,895,000	\$144,000	5,000	I.B.1		66
	1110 C&SF: CERP Central Lake Belt Storage Area	USACE	2011	2036	*	*	640	I.A.1	I.B.1	13
	1414 C&SF: CERP Henderson Creek/Belle Meade Restoration	USACE	2000	2005	*	*	10	I.A.4	I.B.1	39
	1506 Lake Okeechobee Water Retention/Phosphorus Removal	USACE/SFWM	1997	2004	\$16,948,000	\$9,208,000	940	I.B.1		67
	1507 Miccosukee Tribe Water Management Area	Miccosukee	TBD	TBD	\$42,113,000	\$0	900	I.B.1		68
	1508 STA-1 West Works and Outflow Pump Station (G-310)	USACE/SFWM	1994	2000	\$99,370,678	\$76,149,678	6700	I.B.1		69
	1509 STA-2 Works and Outflow Pump Station (G-335)	SFWM	1994	2002	\$110,606,858	\$97,088,858	6430	I.B.1		70
	1510 STA-3/4 Works	SFWM	1994	2004	\$213,213,534	\$129,114,302	16600	I.B.1		71
	1511 STA-5 Works	SFWM	1994	2003	\$48,056,114	\$36,204,253	4118	I.B.1		72
	1512 STA-6 (includes sections 1 and 2)	SFWM	1994	2004	\$21,807,026	\$10,354,727	2222	I.B.1		73
	1513 West Palm Beach Canal (C-51) and STA-1E	SFWM	1999	2003	\$272,900,000	\$151,052,000	6,500	I.B.1		75
I.B.2.	TOTAL MAXIMUM DAILY LOAD (TMDL) PLAN DEVELOPMENT									

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TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE CONTINUED

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg. #
	1600 Total Maximum Daily Load (TMDL) for South Florida	FDEP	2000	TBD	\$3,400,000	\$1,000,000		I.B.2		76
I.B.3.	OTHER RELATED WATER QUALITY PROJECTS									
	1700 Chapter 298 Districts/Lease 3420 Improvements	SPWMD	1994	2004	\$17,642,865	\$17,402,872		I.B.3		77
	1701 Comprehensive Integrated Water Quality Plan	USACE	2001	2006	\$8,100,000	\$3,726,000		I.B.3		78
	1702 Critical Projects Lake Trafford	USACE	1999	2004	\$15,408,000	\$12,296,000		I.B.3	2.A.3	80
	1703 Critical Projects Western C-11 Water Quality Treatment	USACE	1997	2003	\$13,300,000	\$14,813,000		I.B.3		81
	Development of Best Management Practices Related to the Land Application of Residuals and Chicken Manure in the Lake Okeechobee Watershed	SPWMD	2000	2003	\$657,000	\$357,000		I.B.3		82
	1705 Everglades National Park Water & Wastewater	NPS	1997	TBD	\$18,965,000	\$12,485,000		I.B.3		83
	1706 Everglades Stormwater Program	SPWMD	1998	2006	TBD	\$15,200,000		I.B.3		84
	1707 Florida Aquifer Restoration	NRCs	2002	2007	\$1,200,000	\$0		I.B.3		85
	1708 Lake Okeechobee Sediment Removal Feasibility Study and Pilot Project	SPWMD	2000	2003	\$1,953,065	\$1,579,393		I.B.3		86
	1709 Lake Okeechobee Tributary Sediment Removal Pilot Project	SPWMD	2000	2003	\$420,000	\$354,200		I.B.3		87
	1710 Miccosukee Water Resources Management	Miccosukee	TBD	TBD	25,200,000	0		I.B.3		88
	2136 New Palm Dairy Land Acquisition	SPWMD	2000	TBD	*	*		2.A.1	I.B.3	135
	1711 Outfall (Military) Canal Remediation	AFBCA	1999	2002	TBD	\$1,900,000		I.B.3		89
	1712 Pollution Prevention	NRCs/FDACS	2002	2006	\$890,000	\$162,000		I.B.3		90
	1713 S-SA Basin Runoff Diversion Works	SPWMD	1994	2004	\$14,243,205	\$11,123,435		I.B.3		91
	1714 Seminole Tribe Best Management Practices for the Big Cypress Reservation	Seminoles	1996	2004	\$4,779,000	\$955,800		I.B.3		92
	1715 Seminole Tribe Best Management Practices for the Brighton Reservation	Seminoles	1998	2004	\$338,000	\$96,000		I.B.3		93
	Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation	Seminoles	1999	2010	\$15,818,000	\$8,707,000		I.B.3		94
	1717 Seminole Tribe Water Conservation Project for Big Cypress Reservation and Loading Analyses	Seminoles	2002	2012	\$22,452,000	\$0		I.B.3		95
	1718 South Florida Water Quality Protection Program and CERP Numeric Targets	FDEP	2001	2003	\$851,510	\$464,260		I.B.3		96
	1719 STA-1 Inflow and Distribution Works	SPWMD	1994	2003	\$11,223,396	\$10,074,968		I.B.3		98
Goal 2.	RESTORE, PRESERVE AND PROTECT NATURAL HABITATS AND SPECIES									
Sub-Goal 2.A.	RESTORE, PRESERVE AND PROTECT NATURAL HABITATS									
2.A.1.	HABITAT PROTECTION LAND ACQUISITION PROJECTS									
	STATE ACQUISITIONS						ACRES			
	2100 Allapattah Flats/Ranch	FDEP	1997	TBD	\$75,594,990	\$0	34,221	2.A.1	I.A.1	99
	2101 Atlantic Ridge Ecosystem	FDEP/SFWMD	1995	TBD	TBD	\$51,300,000	15,032	2.A.1		100
	2102 Babcock Ranch	FDEP	2001	TBD	TBD	\$0	91,361	2.A.1		101
	2103 Barfield Farms	SPWMD	1998	TBD	TBD	TBD	1,367	2.A.1		102
	2104 Belle Meade	FDEP	1993	TBD	TBD	\$34,100,000	27,200	2.A.1		103
	2105 Big Bend Swamp/Holopaw Ranch	FDEP	2000	TBD	TBD	\$0	54,425	2.A.1		104
	2106 Biscayne Coastal Wetlands	SPWMD/IM-DADE	1998	TBD	\$2,961,668	\$719,597	2,241	2.A.1		105
	2107 Bombing Range Ridge	FDEP	1998	TBD	TBD	\$0	39,073	2.A.1		106
	2108 Caloosahatchee Ecoscape	FDEP	1998	TBD	TBD	\$0	15,391	2.A.1		107
	2109 Catfish Creek	FDEP	1990	TBD	TBD	\$9,100,000	10,609	2.A.1		108
	2110 Cayo Costa	FDEP	1980	TBD	TBD	\$27,600,000	1,932	2.A.1		109
	2111 Charlotte Harbor Flatwoods	FDEP	1986	TBD	TBD	\$52,600,000	54,281	2.A.1		110
	2112 Corkscrew Regional Ecosystem Watershed	FDEP	1991	TBD	TBD	\$22,800,000	59,008	2.A.1		111
	2113 Corkscrew Regional Mitigation Bank	FDEP	1995	1999	TBD	\$2,600,000	633	2.A.1		112
	2114 Coupon Bight/Key Deer Big Pine Key	FDEP	1985	TBD	TBD	\$17,300,000	3,452	2.A.1		113
	2115 Cypress Creek/Trail Ridge	SPWMD	1997	TBD	TBD	\$0	13,788	2.A.1		114
	2116 Dupuis Reserve	SPWMD	1985	1986	\$23,016,601	\$23,016,601	21,875	2.A.1		115

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	2117 East Coast Buffer/Water Preserve Areas	FDEP/SFWMD	1994	TBD	TBD	\$111,900,000	70,883	2.A.1		116
	2118 Estero Bay	FDEP	1985	TBD	TBD	\$8,300,000	16,740	2.A.1		117
	2119 Everglades Agricultural Area (EAA) / Talisman	SFWMD/DOI	1997	1999	\$133,584,552	\$133,584,552	50,719	2.A.1		118
	2120 Fakahatchee Strand	FDEP	1980	TBD	TBD	\$21,200,000	80,231	2.A.1		119
	2121 Fisheating Creek	SFWMD/FDEP	1999	TBD	TBD	\$46,500,000	168,360	2.A.1		120
	2122 Florida Keys Ecosystem	FDEP	1992	TBD	TBD	\$35,200,000	7,611	2.A.1		121
	2123 Frog Pond/L-3 N	FDEP/SFWMD	1994	TBD	TBD	\$80,700,000	10,600	2.A.1		122
	2124 Indian River Lagoon Blueway	FDEP	1998	TBD	TBD	\$400,000	5,136	2.A.1		123
	2125 Juno Hills	FDEP	1994	TBD	TBD	\$15,000,000	440	2.A.1		124
	2126 Kissimmee - St. John Connector	FDEP	2001	TBD	TBD	\$0	34,668	2.A.1		125
	1305 Kissimmee Prairie	FDEP	1996	1997	*	*	38,282	2.A.1	1.A.3	126
	2127 Kissimmee River (Lower Basin)***	SFWMD	1985	2007	see page 23	see page 23	62,628	2.A.1		127
	2128 Kissimmee River (Upper Basin)**	SFWMD	1990	2007	see page 23	see page 23	31,919	2.A.1		128
	2129 Lake Wales Ridge Ecosystem	FDEP	1992	TBD	\$25,200,000	\$19,100,000	12,770	2.A.1		129
	2130 Lake Walk-In-Water	SFWMD	1995	TBD	TBD	\$3,950,000	4,615	2.A.1		130
	2131 Loxahatchee River Land Acquisition	SFWMD	1984	2001	\$11,927,120	\$11,927,120	1,936	2.A.1		131
	2132 Loxahatchee Slough Land Acquisition	SFWMD	1996	2002	TBD	\$21,000,000	15,200	2.A.1		132
	2133 McDaniel Ranch Land Acquisition	SFWMD	2000	TBD	TBD	TBD	7,000	2.A.1		133
	2134 Miami-Dade County Archipelago	FDEP	1994	TBD	TBD	\$6,023,984	856	2.A.1		134
	2135 Model Lands	SFWMD/M-DADE	1994	2007	TBD	\$4,800,000	44,999	2.A.1		135
	2136 New Palm Dairy Land Acquisition	SFWMD	2000	TBD	\$4,800,000	\$4,800,000	2,135	2.A.1	1.B.3	136
	2137 Nicodemus Slough	SFWMD	1981	1988	\$1,744,500	\$1,744,500	2,219	2.A.1		137
	2138 North Fork St Lucie River	FDEP/SFWMD	1988	TBD	TBD	\$4,400,000	3,800	2.A.1		138
	2139 North Key Largo Hammocks	FDEP	1983	TBD	TBD	\$5,900,000	4,508	2.A.1		139
	2140 North Savannas	SFWMD	1997	2002	\$5,000,000	\$5,000,000	930	2.A.1		140
	2141 Okaloacoochee Slough	FDEP/SFWMD	1996	TBD	TBD	\$20,000,000	37,210	2.A.1		141
	2142 Okeechobee Battelfield	FDEP	2001	TBD	TBD	\$0	55	2.A.1		142
	2143 Osceola Pine Savannas	FDEP	1995	TBD	TBD	\$310,000	42,291	2.A.1		143
	2144 Pal-Mar	FDEP/SFWMD	1992	TBD	TBD	\$10,200,000	35,795	2.A.1		144
	2145 Panther Glades	FDEP	2001	TBD	TBD	\$0	21,000	2.A.1		145
	2146 Paradise Run	SFWMD	1998	2001	TBD	\$7,382,633	8,065	2.A.1		146
	2147 Parker-Poinciana	SFWMD	1996	TBD	TBD	TBD	1,970	2.A.1		147
	2148 Pineland Site Complex	FDEP	1996	TBD	TBD	\$280,000	250	2.A.1		148
	2149 Rookery Bay	FDEP	1980	TBD	TBD	\$46,200,000	18,721	2.A.1		149
	2150 Rorenberger/Holey Land Tract	FDEP	1984	TBD	TBD	\$18,100,000	79,170	2.A.1		150
	2151 Shingle Creek	SFWMD	1987	TBD	TBD	\$1,344,400	7,655	2.A.1		151
	2152 Six Mile Cypress Land Acquisition	SFWMD	1987	TBD	TBD	\$2,098,000	1,741	2.A.1		152
	2153 South Fork St. Lucie River Land Acquisition	SFWMD	1995	1995	\$2,480,000	\$2,480,000	184	2.A.1		153
	2154 South Savannas	FDEP/SFWMD	1981	TBD	TBD	\$16,900,000	6,046	2.A.1		154
	2155 Southern Glades	SFWMD/M-DADE	1964	TBD	TBD	\$13,741,347	37,620	2.A.1		155
	2156 Southern Golden Gate Estates	FDEP	1984	TBD	TBD	\$88,100,000	57,200	2.A.1		156
	2157 Tibet-Butler Preserve	SFWMD	1988	1999	\$3,601,900	\$3,601,900	439	2.A.1		157
	2158 Twelve Mile Slough	SFWMD	1998	TBD	TBD	TBD	3,300	2.A.1		158
	2159 Upper Lakes Basin Watershed	SFWMD	1995	2002	TBD	\$10,093,957	47,300	2.A.1		158

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 ** Consistent with authorizing Big Cypress legislation
 ***See Kissimmee River Restoration Project

TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE CONTINUED

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg. #
	2160 Water Conservation Areas 1,2, and 3	SFWMD	1948	2010	TBD	\$9,259,882	819,535	2.A.1		159
	2161 Yamato Scrub	FDEP	1992	1996	\$17,500,000	\$17,500,000	207	2.A.1		160
	FEDERAL ACQUISITIONS						ACRES			
	2162 A.R.M. Loxahatchee National Wildlife Refuge	USFWS	1955	2005	\$30,119,000	\$129,000	149,016	2.A.1		161
	2163 Big Cypress National Preserve Addition	NPS	1989	2003	\$54,656,000	\$49,377,000	6,113	2.A.1		162
	2164 Big Cypress National Preserve Private Inholdings**	NPS	1974	TBD	\$204,467,292	\$182,421,000	878	2.A.1		163
	2165 Complete Land Acquisition for Biscayne National Park	NPS	1968	2005	TBD	\$31,851,000	172,924	2.A.1		164
	2166 Coccolide Lake National Wildlife Refuge	USFWS	1979	2003	\$14,319,000	\$13,093,000	7,100	2.A.1		165
	2167 East Everglades Addition to Everglades National Park	NPS	1990	2000	\$113,149,000	\$109,504	109,504	2.A.1		166
	2168 Florida Keys National Wildlife Refuge Complex	USFWS	1960	2005	\$63,017,000	\$30,232,000	415,436	2.A.1		167
	2169 Florida Panther National Wildlife Refuge	USFWS	1989	TBD	\$10,682,000	\$10,682,000	1,130	2.A.1		168
	2170 Hobe Sound National Wildlife Refuge	USFWS	1968	2004	\$5,818,000	\$18,000	1,130	2.A.1		169
	2171 J.N. "Ding" Darling National Wildlife Refuge	USFWS	1945	2005	\$31,252,000	\$7,252,000	8,360	2.A.1		170
2.A.2.	CORAL REEF PROTECTION PROJECTS									
	2200 Planning and Implementation of the Tortugas Ecological Reserve	NOAA	1998	2001	\$873,552	\$0		2.A.2		171
2.A.3	IMPROVE NATURAL AREAS HABITAT QUALITY PROJECTS						ACRES			
	Note – The April, 1999 USACE Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement included an extensive environmental evaluation of habitat units that would be improved through implementation of the CERP projects. Table 7.18 in this publication identifies in detail which projects are anticipated to achieve this objective. However, appropriate measures by project are currently being developed through the establishment of interim goals. There are some projects included in our tracking matrix that exemplify how this objective will be achieved.									
	2300 C&SF CERP Protect and Enhance Existing Wetland Systems along LNNWR (Strazulla Tract)	USACE/SFWMD	2002	2007	\$52,772,000	\$292,000	10,000	2.A.3		172
	2301 C&SF CERP Wmnsburg Farms Wetland Restoration	USACE	2000	2005	\$14,140,000	\$855,000	175	2.A.3		173
	2302 C&SF CERP Lake Park Restoration	USACE/Lee Co.	1999	2004	\$5,166,000	\$78,000	40	2.A.3		174
	2303 C&SF CERP Restoration of pineland and hardwood hammocks in C-111 Basin	USACE	2003	2009	\$600,000	\$0	50	2.A.3		175
	3803 C&SF CERP Wastewater Reuse Technology Pilot Project	USACE/SFWMD	2001	2013	*	*		3.C.2	2.A.3	209
	C&SF CERP WCA -3 Decompartamentalization and Sheetflow Enhancement (AA)(OO)(SS)	USACE/SFWMD	2001	2015	*	*		1.A.3	2.A.3	18
	1111 Critical Ecosystems Restoration Projects - Ten Mile Creek	USACE/SFWMD	1997	2003	*	*	2,740	1.A.1	2.A.3	14
	1702 Critical Projects Lake Trafford	USACE	1999	2004	*	*		1.B.3	2.A.3	79
	2606 Hole-in-the-Donut	NPS	1994	2017	*	*		2.B.4	2.A.3	187
	1306 Kissimmee River Restoration Project	USACE/SFWMD	1994	2010	*	*	27,000	1.A.3	2.A.3	23
2.A.4.	OTHER NATURAL HABITAT AND SPECIES PROJECTS						TBD			
	2400 Big Cypress National Preserve Mineral Rights	NPS	2000	TBD	TBD	\$0		2.A.4		176
	2401 C&SF CERP: Flow to Northwest and Central WCA-3A (II)(RR)	USACE/SFWMD	2001	2011	\$30,877,000	\$444,000		2.A.4		177
	1307 Modified Water Deliveries to Everglades National Park	NPS	1990	2005	*	*		1.A.3	2.A.4	24
	2402 South Florida Multi-Species Recovery Plan	USFWS	1994	2010	\$174,743,000	\$80,193,000		2.A.4		178
	2403 WCA-2A Regulation Schedule Review	USACE	TBD	TBD	\$500,000	\$0		2.A.4		180
Sub-Goal 2.B.	CONTROL INVASIVE PLANT AND ANIMAL SPECIES									
2.B.1	INVASIVE EXOTIC PLANT SPECIES MANAGEMENT PLAN DEVELOPMENT						Completed Plans			
	2500 Coordinate the development of management plans for top 20 south Florida exotic pest plants	NEWTT	2001	2011	\$600,000	\$0	20	2.B.1		181
2.B.2.	EXOTIC PLANT SPECIES MAINTENANCE CONTROL PROJECTS									
	2600 Achieve "Maintenance Control" status for Brazilian Pepper, Melaleuca, Australian pine and Old world climbing fern in all natural areas statewide by 2020	SFWMD	2002	2020	\$139,078,000	\$70,740,000	4	2.B.2		182
	2601 Integration of Federal, State, and Local Agency Invasive Exotic Control Programs into Florida-wide Strategy	FDEP	2000	2005	TBD	\$76,418,000		2.B.2		183

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TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE CONTINUED

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg. #
2602	C&F/CERP- Melaleuca Eradication Project and other Exotic Plants	USACE	2006	2011	\$5,772,000	\$0		2.B.2		184
2603	Hestero Bay Aquatic Preserve and Buffer Reserve Enhancement and Exotic Removal Project	FDEP	1998	2004	\$668,000	\$1,43,000		2.B.2		185
2604	Everglades National Park Exotic Control Program	NPS	2002	TBD	\$2,150,000	\$1,300,000		2.B.2		186
2605	Exotic Species Removal	Seminoles	1998	2010	\$988,000	\$152,000		2.B.2		187
2606	Hole-in-the-Donut	NPS	1994	2017	\$7,500,000	\$1,582,000		2.B.2	2.A.3	188
2607	Melaleuca Control (Critical) Big Cypress National Preserve	NPS	1998	2005	\$1,400,000	\$1,050,000		2.B.2		189
2.B.3.	INVASIVE EXOTIC PLANT SPECIES PREVENTION PLAN DEVELOPMENT									
2700	Complete an Invasive Exotics Plant Prevention, Early Detection and Eradication Plan by 2005	NEWT/DEPNIPS	2001	2004	\$5,000,000	\$0		2.B.3		190
GOAL 3.	FOSTER COMPATIBILITY OF THE BUILT AND NATURAL SYSTEM									
Sub-Goal 3.A.	USE AND MANAGE LAND COMPATIBLE WITH RESTORATION									
3.A.1	FLORIDA GREENWAYS AND TRAILS SYSTEM PROJECTS									
3100	Florida Greenways and Trails Designation Project	FDEP/OGT	2000	TBD		No direct cost to state	Acres	3.A.1		192
3101	Florida Greenways and Trails Land Acquisition Project	FDEP/OGT	2000	TBD	\$4,500,000 annually	\$13,500,000	TBD	3.A.1		193
3.A.2	AGRICULTURE LANDS CONSERVATION MANAGEMENT PROJECTS									
3200	Agriculture Land Stewardship	NRCS/FDACS	2002	2014	\$5,200,000	\$1,300,000	Acres	3.A.2		195
3201	Technical Assistance to Seminole and Miccosukee Indian Reservations	NRCS	1998	2009	\$900,000	\$300,000	107,000	3.A.2		196
3202	Wetland Reserve Program	NRCS	1997	2008	\$6,290,000	\$0	27,000	3.A.2		197
3.A.3	FLORIDA PARK, RECREATION AND OPEN SPACE LANDS PROJECTS									
3300	Florida Communities Trust Grant Program	FDOCA/FCT	2000	TBD	see project sheet	\$60,500,000	Acres	3.A.3		198
3.A.4	BROWNFIELDS REHABILITATION AND REDEVELOPMENT PROJECTS									
3400	Eastward Hol. Brownfields Partnership	SFRPC	1998	2010	TBD	\$22,544,000	1,000	3.A.4		199
3.A.5	INCREASE COMMUNITY UNDERSTANDING OF RESTORATION PROJECTS									
3500	USDA/NRCS/South Florida Ecosystem Restoration Council & Committee Earth Team Project	USDA	2002	TBD	\$750,000	\$0		3.A.5		200
Sub-Goal 3.B	FLOOD PROTECTION COMPATIBLE WITH ECOSYSTEM RESTORATION									
3.B.1	FLOOD PROTECTION COMPATIBLE WITH ECOSYSTEM RESTORATION PROJECTS									
3600	C-4 Flood Mitigation Projects	SFWMD	2001	2004	\$40,300,000	\$25,900,000		3.B.1		201
3700	C&F/CERP Canal TTI	USACE/SFWMD	1994	2005	*	*		1.A.3	3.B.1	17
Sub-Goal 3.C	PROVIDE SUFFICIENT WATER RESOURCES FOR BUILT AND NATURAL SYSTEMS									
3.C.1	WATER RESOURCE DEVELOPMENT PROJECTS									
3700	Kissimmee Basin Water Supply Plan	SFWMD	2002	2006	\$4,205,000	\$1,620,000	MGD	3.C.1		203
3701	Lower East Coast Water Supply Plan	SFWMD	2002	2006	\$23,209,000	\$3,457,000	62	3.C.1		204
3702	Lower West Coast Water Supply Plan	SFWMD	2002	2006	\$19,784,000	\$1,564,000	143.0	3.C.1		205
3703	Upper East Coast Water Supply Plan	SFWMD	2002	2006	\$3,783,000	\$903,000	151	3.C.1		206
3.C.2	INCREASE VOLUME OF WATER RESOURCE PROJECTS									
3800	C&F/CERP-South Miami-Dade County Reuse	USACE/MDADE	2011	2020	\$36,304,000	\$0	MGD	3.C.2		207
3801	C&F/CERP-West Miami-Dade County Reuse	USACE/MDADE	2011	2020	\$437,237,000	\$0	100	3.C.2		208
3802	C&F/CERP Wastewater Reuse Technology Pilot Project	USACE/SFWMD	2001	2013	\$30,000,000	\$1,030,000	100	3.C.2	2.A.3	209
3803	Lower West Coast Regional Irrigation Distribution System Master Plan Study Northern Palm Beach County and Southern Martin County Reclaimed Water Master Plan	SFWMD	2002	2006	Included in Project #3702			3.C.2		210
3804		SFWMD	2002	2002	Included in Project #3701			3.C.2		211

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** Consistent with authorizing Big Cypress legislation

***See Kissimmee River Restoration Project

TABLE 10: SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE PROJECT SUMMARY TABLE CONTINUED

Goals	Project Name	Org.	Start	End	Financial Requirement	Appropriated to Date	Measurable Targets	Primary Objective	Secondary Objectives	Vol. 2 Ref. Pg #
	3805 Orlando/Kissimmee Area Regional Reclaimed Water Optimization Plan	SFWMD	2002	2005	Included in Project #3700			3.C.2		212
	2301 CERP Wynburg Farms Wetland Restoration	PBCo.	1999	2003	*	*		2.A.3	3.C.2	173
3.C.3	ALTERNATIVE WATER SUPPLY PROJECTS						MGD			
	3900 Alternative Water Supply Grant	SFWMD	1996	TBD	TBD	\$32,713,900	50	3.C.3		213
3.C.4	IRRIGATION WATER CONSUMPTION REDUCTION PROJECTS						ACRE-FT			
	4000 Mobile Irrigation Lab	NRCS	1998	2011	\$2,801,000	\$863,000		3.A.2		214
3.C.5	OTHER BUILT AND NATURAL SYSTEM COMPATIBILITY PROJECTS									
	4100 Keys Carrying Capacity Study	FDCA/USACE	1997	2002	\$6,000,000	\$6,000,000		3.C.5		215
	4101 BMPs for Agriculture	NRCS	1997	2011	\$65,245,000	\$15,000,000		3.C.5		216
	4102 Monitoring of Organic Soils in the Everglades	NRCS	1998	2012	\$1,236,000	\$136,000		3.C.5		217
	4103 Soil Survey Update for the Everglades Agricultural Area	NRCS	2002	2005	\$1,500,000	\$250,000		3.C.5		218

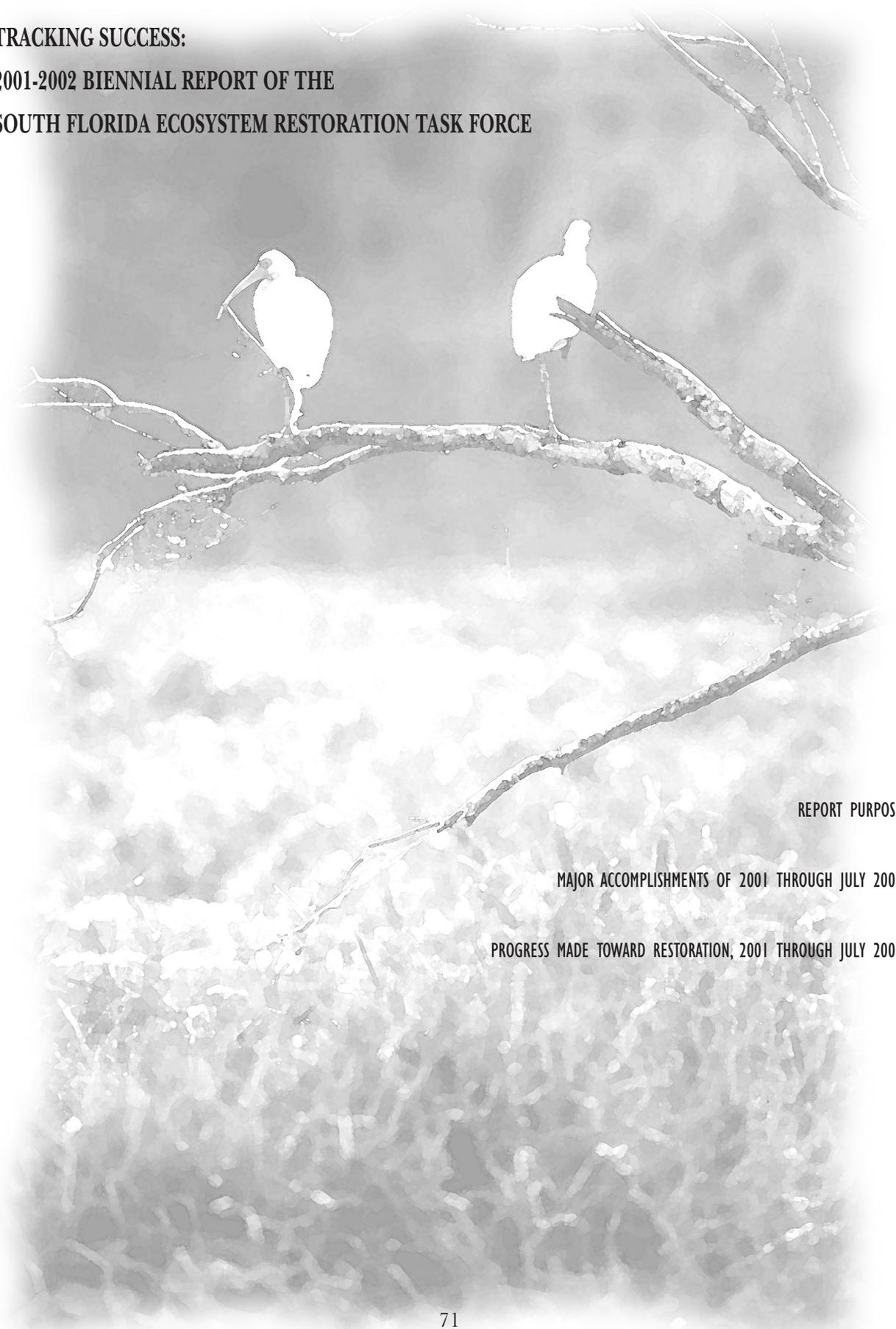
* This is a multiple objective project funding is listed in other objective

** Consistent with authorizing Big Cypress legislation

***See Kissimmee River Restoration Project

Goals, Sub-Goals & Objectives
GOAL 1: GET THE WATER RIGHT
Sub-Goal 1.A: GET THE HYDROLOGY RIGHT (Quantity, Timing & Distribution)
1.A.1: Surface Water Storage Projects
1.A.2: Aquifer Storage and Recovery (ASR) Projects
1.A.3: Modifying Impediments to Sheetflow Projects
1.A.4: Other Related Hydrology Projects
Sub-Goal 1.B: GET THE WATER QUALITY RIGHT
1.B.1: Stormwater Treatment Area (STA) Projects
1.B.2: Total Maximum Daily Load (TMDL) Plan Development
1.B.3: Other Related Water Quality Projects
GOAL 2: RESTORE, PRESERVE & PROTECT NATURAL HABITATS & SPECIES
Sub-Goal 2.A: RESTORE, PRESERVE AND PROTECT NATURAL HABITATS
2.A.1: Habitat Protection Land Acquisition Projects
2.A.2: Coral Reef Protection Projects
2.A.3: Improve Natural Areas Habitat Quality Projects
2.A.4: Other Natural Habitat and Species Related Projects
Sub-Goal 2.B: CONTROL INVASIVE PLANT AND ANIMAL SPECIES
2.B.1: Invasive Exotic Plant Species Management Plan Development
2.B.2: Exotic Plant Species Maintenance Control Projects
2.B.3: Invasive Exotic Plant Species Prevention Plan Development
Goal 3: FOSTER COMPATIBILITY
Sub Goal 3.A.: USE AND MANAGE LAND IN A MANNER COMPATIBLE WITH RESTOTATION
3.A.1: Florida Greenways and Trails System Projects
3.A.2: Agriculture Lands Conservation Management Projects
3.A.3: Florida Park, Recreation and Open Spaces Lands Projects
3.A.4: Brownfields Rehabilitation and Redevelopment Projects
3.A.5: Increase Community Understanding of Ecosystem Restoration Projects
Sub-Goal 3.B: FLOOD PROTECTION COMPATIBLE WITH ECOSYSTEM RESTORATION
3.B.1: Flood Protection for a Compatible Built and Natural System Projects
Sub-Goal 3.C: PROVIDE SUFFICIENT WATER RESOURCES FOR BUILT AND NATURAL SYSTEMS
3.C.1: Water Resource Development Projects
3.C.2: Increase Volume of Water Reuse Projects
3.C.3: Alternative Water Supply Program Projects
3.C.4: Irrigation Water Consumption Reduction Projects
3.C.5: Other Built and Natural System Compatibility Projects

**TRACKING SUCCESS:
2001-2002 BIENNIAL REPORT OF THE
SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE**



REPORT PURPOSE

MAJOR ACCOMPLISHMENTS OF 2001 THROUGH JULY 2002

PROGRESS MADE TOWARD RESTORATION, 2001 THROUGH JULY 2002

Report Purpose

This biennial report summarizes the progress made in 2001 through July 31, 2002, to restore the South Florida ecosystem.

The 1996 Water Resources Development Act (WRDA) directs the South Florida Ecosystem Restoration Task Force (the Task Force) to report biennially on the following Task Force activities:

- Policies, strategies, plans, programs, projects, and activities and priorities planned, developed, or implemented for South Florida ecosystem restoration
- Progress made toward restoration

This report satisfies the WRDA requirements by providing the following information: First, it summarizes the major accomplishments of the reporting period in terms of policies, strategies, plans, programs, projects, and activities. Second, it tracks the progress made toward restoration during the reporting period in terms of selected

measurable indicators of ecosystem health.

This report is intended for four principal audiences:

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

This report is intended to demonstrate to the above authorities that progress is being made and that funds targeted for restoration are being spent in logical and accountable ways. The information included here will also be broadly shared with state and federal agencies, local governments, regional agencies and industries, private interest groups, and private citizens interested in South Florida ecosystem restoration.

Policies, Strategies, Plans, Programs, Projects, Activities:**Major Accomplishments - 2001 Through July 2002**

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, is provided in *Coordinating Success: Strategy for Restoration of the South Florida Ecosystem* (the preceding report in this larger document). This biennial report, *Tracking Success*, addresses only the Task Force member agencies' activities during the past two years, and it covers only the highlights of those activities. More complete and detailed discussions of the recently completed and ongoing projects can be found in reports produced by the participating agencies, particularly the U.S. Army Corps of Engineers (USACE), the South Florida Water Management District (SFWMD), and the Florida Department of Environmental Protection (FDEP).

Coordination and Adaptive Management of the Restoration Effort*REVISION OF JULY 2000 TASK FORCE STRATEGY DOCUMENT*

The Task Force and working group revised *Coordinating Success: Strategy for Restoration of the South Florida Ecosystem* for submittal to Congress in September 2002. This revision incorporated new information on restoration and responded to the March 2001 comments of the General Accounting Office. The revised strategy maintains the three broad goals identified in the original document and expands on the measurable objectives for goal 3, foster compatibility of the built and natural systems.

PRESIDENTIAL/GUBERNATORIAL AGREEMENT

WRDA 2000 requires a binding agreement between the Governor of Florida and the President of the United States regarding the implementation of the *Comprehensive Everglades Restoration Plan* (CERP), under which "the state shall ensure, by regulation or other appropriate

means, that water made available by each project in the plan shall not be permitted for a consumptive use or otherwise made unavailable by the State until such time as sufficient reservations of water for the preservation of the natural system are made under State law." This agreement was signed by the President and the Governor January 9, 2002.

CERP PROGRAMMATIC REGULATIONS

The agreement to ensure that water produced by the CERP will be allocated appropriately under state law to restore the Everglades natural system is being complemented by programmatic regulations being developed by the USACE in cooperation with its federal, state, tribal, and non-governmental partners. These regulations must be issued by December 11, 2002, and require the concurrence of the Secretary of the Interior and the Governor of Florida. Although largely procedural, the programmatic regulations will define the relationships and the processes to be utilized among all the parties to ensure that the goals and objectives of the CERP are achieved.

DESIGNATION OF WATER RESOURCES ADVISORY COMMISSION

On March 15, 2001, the SFWMD adopted a resolution that created a multi-stakeholder Water Resources Advisory Commission (WRAC) as a means of obtaining stakeholder input on the SFWMD efforts to manage South Florida's critical water resources. The main purpose of WRAC, an advisory body to the Governing Board of the SFWMD, is to develop consensus-based recommendations regarding future water resource activities needed to restore, preserve and protect the greater South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection.

In January 2002 the Task Force formally selected

the WRAC as an advisory body to the Task Force.

IMPLEMENTATION OF ANALYTICAL TOOLS TO TRACK ECOSYSTEM HEALTH

Work has been underway in this reporting period to begin establishing the base lines and monitoring systems that will make it possible to systematically track the progress of the restoration effort. In May 2001 the Restoration Coordination and Verification Team (RECOVER) finished a management plan with recommendations to guide ecosystem monitoring and adaptive management of the CERP programs and projects, which comprise the largest single component of the restoration effort. The recommendations of RECOVER will be used by the USACE in its development of interim goals pursuant to the CERP programmatic regulations. Also in 2001 the RECOVER team developed a conceptual ecological model for the region covered by the CERP and launched a centralized data base that will enable scientists to quickly access information about multiple agency restoration projects. The team has developed an initial set of recommended performance measures for the CERP that may be used to monitor ecosystem health, and scientists have begun gathering the base line data that will be used to assess progress toward recovery.

Goal I Accomplishments: Getting the Water Right

STATE AND FEDERAL CERP FUNDING COMMITMENTS

The federal and state budgets for this reporting period both reflect a continued priority to restore America's Everglades. The budgets each propose future funding that will build upon past efforts and improve collaborative interagency efforts to restore the Everglades, which are recognized both nationally and internationally to be like no other place on earth.

The federal and state governments have strongly supported restoration efforts during this biennial reporting period. In keeping with this continued joint commitment, Congress enacted over \$665 million and the State of Florida funded over \$1.3 billion for CERP projects, non-CERP Everglades

ecosystem restoration projects, and non-CERP Everglades ecosystem restoration program support activities. (See the table 11 footnotes for details of the different reporting periods for the state and federal governments.)

In early summer 2002 the Florida Legislature enacted, and Governor Jeb Bush signed into law, House Bill 813, which provides for a dedicated source of funds to pay the state share of the costs to implement the CERP through 2010. The act establishes the Everglades Restoration Bonding Program and authorizes the FDEP to issue revenue bonds of up to \$100 million per year, or more if the need to acquire land or to implement CERP projects is documented, for the period of state fiscal years 2002-03 through 2009-10. The revenues from the issuance of the Everglades Restoration Bonds must be used to implement the CERP.

CERP PILOT PROJECT IMPLEMENTATION

Project management plans for three of the six authorized CERP pilot projects were completed in 2001. These were the Hillsboro ASR Pilot Project, Lake Okeechobee ASR Pilot Project, and Caloosahatchee River Basin ASR Pilot Project. Aquifer storage and recovery is a significant water resource storage component of the CERP. The pilot projects will address technical and regulatory uncertainties and demonstrate the viability of storing partially treated surface water or groundwater in the brackish Floridan Aquifer for subsequent recovery. *Draft Project Management Plans* for the three other pilot projects were completed and circulated for review. These pilot projects address seepage management, wastewater reuse, and water storage.

WATER QUALITY STANDARDS

In December 2001 the FDEP issued a proposed standard for phosphorus in the Everglades Protection Area of 10 parts per billion for all predominantly freshwater portions of the Everglades Agricultural Area. As the state identifies additional projects to improve water quality, the USACE will evaluate whether the projects

are essential to the successful implementation of the CERP and whether the federal government should participate in them and share their costs. The participants have agreed that future project authorization proposals will reflect the cumulative changes to the CERP in terms of projects and costs and indicate the progress being made toward implementing the CERP.

UPDATE ON ONGOING PROJECTS PREDATING THE CERP

Kissimmee River Restoration Project

The Kissimmee River Restoration Project, authorized in WRDA 1992, is under construction. The project, which is being jointly implemented and cost-shared by the SFWMD and the USACE, will restore over forty square miles of river/floodplain ecosystem, including forty-three miles of meandering river channel and 27,000 acres of wetlands. Reach 1, which involves back-fill of the first 7 miles of canal, was completed in August 2001. This project is moving forward at a steady pace with design underway for the Railroad Bridge, the US 98 bridge, and various flood-proofing components.

Everglades Construction Project

In 1999 and 2000 the SFWMD completed construction on three additional stormwater treatment areas (STA-1 West, STA-2, and STA-5), bringing the total effective treatment area in operation to over 18,000 acres in four stormwater treatment areas. Following construction, a start-up process was initiated that included inundation of the areas to target depths and establishment of desired vegetation. Due to exceptional phosphorus removal performance observed in the prototype Everglades Nutrient Removal Project, portions of the new stormwater treatment areas are being managed for submerged aquatic vegetation; the remainder is being managed for cattails and other emergent vegetation. The phosphorus removal performance of the stormwater treatment areas has exceeded expectations, with discharges from STA-1W, STA-2, and STA-6 consistently below 30 parts per billion (ppb). Although still consid-

ered a young wetland system, STA-5 has been able to reduce inflow concentrations averaging 245 ppb to about 80 ppb. Construction on STA-1 East, which began in 2000, currently involves five construction contracts underway to build the 6,200-acre stormwater treatment area and the two major inflow and discharge pump stations. Construction on STA-3/4 (the largest) was initiated in 2001. Start-up operations are expected to begin in the fall 2003 for both areas. Since 1994 the stormwater treatment areas have removed almost 200 tons of phosphorus that would have otherwise entered the Everglades.

Reducing phosphorus levels to around 50 ppb will not be sufficient to achieve the long-term phosphorus standard for the Everglades. Implementation of additional water quality measures, including STA optimization and advanced treatment, will be necessary to achieve the long-term standard. The SFWMD has continued small-scale research on several advanced treatment technologies that will be utilized to lower phosphorus to achieve the long-term Everglades standard. Some of the key technologies evaluated include submerged aquatic vegetation, periphyton-based stormwater treatment areas, chemical treatment, and optimization of the stormwater treatment areas.

Critical Restoration Projects

In January 2000 the USACE executed project cooperation agreements to implement nine ecosystem restoration projects under the Critical Restoration Projects authority provided in WRDA 1996. Congress authorized the Critical Restoration Projects to provide ecosystem restoration benefits prior to the completion of the CERP, which was under development at the time of this authorization. WRDA 1996 specified that each Critical Project must produce immediate, substantial and independent benefits and must be consistent with the conceptual framework for Everglades restoration included in the Governor's Commission's *Conceptual Plan for the Central and Southern Florida Project Restudy*. Progress on these projects as of July 2002 is as follows:

- **East Coast Canal Structures:** Construction of a water control structure in the western reach of the C-4 canal is nearly complete. This project will help reduce seepage losses from the Everglades, increase aquifer recharge, and enhance habitat in the Pennsuco Wetlands.
- **Western C-11 Basin Water Quality Treatment:** Construction of a pump station to house four new seepage return pumps is nearing completion. Design of a new divide structure for the C-11 canal is underway; construction is scheduled to start in early 2003. During non-flood conditions, these new features will separate seepage from stormwater runoff, allowing return of relatively clean seepage waters to WCA-3A.
- **Tamiami Trail Culverts:** This project involves the installation of approximately 80 culverts under the Tamiami Trail and Loop Road to help restore more natural hydropatterns and improve sheet-flow of surface water within Ten Thousand Islands National Wildlife Refuge, Big Cypress National Preserve, and Everglades National Park. Design is 60 percent complete; construction is scheduled to start in mid 2003.
- **Seminole Big Cypress Reservation Water Conservation Plan:** Construction of the Phase I Conveyance Canal System, managed by the Seminole Tribe, is 35 percent complete. These canals will transport water to the project's water management features to be constructed in phase II. The Corps of Engineers is contracting for the detailed design of Phase II, a system of water storage cells and water resource areas. This project will restore the Big Cypress reservation's water storage capacity, bring back native vegetation, remove exotics, and reduce the concentration of phosphorus from water flowing off the reservation. Outflows from the project will be routed southward to rehydrate the Reservation's undeveloped Native Area and the Big Cypress National Preserve.
- **Southern CREW Addition/Imperial River Flowway:** This project involves acquisition of approximately 4,600 acres and restoration of historic sheetflow. Benefits include restoration of historical storage potential in the project lands, reduced freshwater discharges to Estero Bay during the rainy season, reduced loading of nutrients to the Imperial River and Estero Bay, and reduced flooding of homes and private lands west of the project area. Real estate acquisition is over 50 percent complete; construction of modifications to the Kehl Canal weir has been completed.
- **Lake Okeechobee Water Retention/Phosphorus Removal:** This project involves construction of two stormwater treatment areas and restoration of isolated wetlands on privately owned agricultural lands. Project benefits include attenuation of peak flows and improvement of water quality discharged to Lake Okeechobee. Design is 60 percent complete; construction is scheduled to start in late 2003.
- **Ten Mile Creek Water Preservation Area:** This project involves construction of a 550-acre water preserve area and a 134-acre stormwater treatment area to attenuate flows and improve water quality to the St. Lucie Estuary and Indian River Lagoon. Design is complete; construction is scheduled to start in late 2002.
- **Lake Trafford Restoration:** This project will improve water quality and enhance fish and wildlife habitat in Lake Trafford by removing approximately 8.5 million cubic yards of organic sediments that blanket the bottom of the lake. Alternative designs and methodologies are being evaluated to maximize cost-effectiveness.
- **Florida Keys Carrying Capacity Study:** Task Force members are working with stakeholders to ensure that the final product has addressed the comments provided by the National Academy of Sciences. Some comments could not be addressed due to lack of data or science. The primary goal of the government is to ensure that the study provides a useable model to address the original need and goal of the study and to provide local planners and decision makers with a tool to determine if and how their comprehensive plans should be amended.

Modified Water Deliveries to the Everglades National Park Project

Modified Water Deliveries (MWD) Project was

authorized as a part of the Everglades National Park Protection and Expansion Act of 1989. The project improves water deliveries into Everglades National Park (ENP) and to the extent practicable will restore the natural hydrological conditions within the park. All funding for planning, design, construction, and real estate acquisition is provided through the Department of the Interior. In 1992 the USACE completed a General Design Memorandum (GDM) identifying the features of the plan. The project will also, to the extent practicable, improve the natural and hydrologic conditions in WCAs 3-A and 3-B. The project consists of several structural features that are the intended to restore conveyance of water between water conservation areas north of ENP and the Shark River Slough within the park. This will be done through the removal and modification of existing levees and canals, along with the construction of new water control structures and pump stations. The project design also includes a plan to provide flood mitigation to the 8.5 Square Mile Area, a residential area adjacent to the park expansion boundary in the East Everglades and to provide a flood mitigation plan for the Tigertail Camp along Tamiami Trail. In 1994 Congress amended the 1989 act to authorize funding to assist in acquisition of lands in the 8.5 Square Mile Area by the State of Florida, if the state so chose. In June 1999 the USACE, at the request of the local sponsor, initiated a *General Re-evaluation Report (GRR)* and *Supplemental Environmental Impact Statement (SEIS)* to review the plans for the 8.5 Square Mile Area. In June 2000 the SFWMD Governing Board recommended to the USACE that alternative 6(d), a modified canal and levee alternative in the GRR, be adopted as the modified plan for the 8.5 Square Mile Area.

Recent project-related activities include the following:

- Design is underway for the seepage/conveyance features that will ensure that more natural water flows will occur as the MWD Project is implemented.
- A draft GRR and SEIS to examine project effects on the existing Tamiami Trail roadway has been

released for public comment.

- In December 2000 the USACE signed a record of decision approving alternative 6(d) as the federal project, and work began on that alternative. On July 5, 2002, the U.S. District Court for the Southern District of Florida entered judgment against the United States, setting aside the USACE revised plan for the 8.5 Square Mile Area on the grounds that alternative 6(d) falls outside statutory authority. Based on this judgment, the USACE has stopped work on that part of the project. However, the USACE is working to resolve issues raised by this decision.

Completion of the MWD Project is important to federal, state, and local interests as well as to the implementation of the CERP. Congress authorized the MWD Project in 1989 with an initial implementation goal of 1997. Congress has clearly expressed its desire that the MWD Project be completed. The linkage between completion of the project and implementation of the CERP was expressed in WRDA 2000, which states that "No appropriation shall be made to construct Water Conservation Area 3

Decomartmentalization and Sheetflow Enhancement Project" and certain other components "until the completion of the project to improve water deliveries to Everglades National Park." The Miami-Dade County Flooding Task Force, finding that a completed MWD Project would have lessened the flooding impacts of Hurricane Irene and the No Name 2000 storm, has recommended that both the MWD and C-111 Projects be implemented expeditiously. Finally, the U.S. Fish and Wildlife Service identified this project as essential to the recovery of the endangered Cape Sable seaside sparrow. It is vital to the future of Everglades restoration that the MWD Project be completed as soon as possible.

C-111 Project/Taylor Slough Bridge Project

The C-111 Project was initially authorized by the Flood Control Act of 1962 and modified by several authorizations since that time. A General Reevaluation Report completed in 1994 detailed the current plan to improve water deliveries to Everglades National Park while maintaining

flood control in the system. Restructuring this project will help restore flows from Taylor Slough to Florida Bay. In January 2001 a second GRR and SEIS addressing the addition of features for water quality improvement, land exchange between Everglades National Park and the SFWMD, and cost sharing was released to the public. The entire project is scheduled for completion in 2006.

Two components of the revised C-111 project have been constructed. The Taylor Slough Bridge (the entry road to Everglades National Park) was redesigned and constructed by the USACE, with technical assistance from the Department of the Interior, and now allows more natural water flow from the C-111 basin into the Taylor Slough section of Everglades National Park. The C-111 "spoil removal" project is complete, allowing for a more natural sheet flow of water in the eastern panhandle area of the park.

Goal 2 Accomplishments: Restoring, Preserving, and Protecting Natural Habitats and Species

HABITAT ACQUISITION

State and federal agencies have acquired 4.9 million acres of land for habitat preservation. As of September 2001 the state had acquired 3.5 million acres of habitat conservation land in South Florida at a cost of over \$1.5 billion.

In April 2000 the U.S. General Accounting Office (GAO) reported that a land acquisition plan was needed to identify and prioritize additional lands needed to achieve the restoration goals. The GAO report highlighted the importance of acquiring as much land as possible, and quickly, because undeveloped land in South Florida is becoming increasingly scarce and costly. A Land Acquisition Task Team was formed in 2001 and has developed a draft strategy and land acquisition project tracking matrix. The strategy describes the land acquisition needed for ecosystem restoration projects which are either wholly federally funded or jointly funded by federal and nonfederal agencies.

HIGHLIGHTS OF HABITAT MANAGEMENT

Loxahatchee State/Federal Agreement

In June 2002 the SFWMD and the U.S. Fish and Wildlife Service (FWS) signed a new license agreement for the Arthur R. Marshall Loxahatchee National Wildlife Refuge located in Palm Beach County, Florida.

The new license continues the use of WCA-1 as a national refuge for another 50 years. The license sets forth the terms and conditions for the refuge to operate within the context of the regional South Florida water resources management system and the various state and federal obligations to restore and protect the Everglades. The new license also includes specific management goals and objectives linked to the refuge's *Comprehensive Conservation Plan*. The progress towards meeting these goals, which include bringing all exotic infestations under maintenance control by 2017, will be publicly reviewed every five years.

The SFWMD and the FWS believe that this agreement will contribute to the state and federal partnership dedicated to the restoration of the Everglades ecosystem in South Florida.

Coral Reef Protection

In July 2001 the National Oceanic and Atmospheric Administration created the Tortugas Ecological Reserve within the Florida Keys National Marine Sanctuary. The reserve fully protects 151 square nautical miles of coral reefs and associated communities. In 2002 the National Park Service (NPS) designated a Research Natural Area within Dry Tortugas National Park that will fully protect an additional 46 square nautical miles of coral reefs and marine habitats. Once the regulation phase is completed for the Research Natural Area, full protection will be extended to a total of 197 square nautical miles of critical habitats, including coral reefs, and more than 10 percent of the coral reefs in the Florida Keys will be protected.

Table 11. Land Acquisition Expenditure Summary, FY 2001- FY 2002*

Funding Source	Amount (\$ millions)	Acres
Farm Bill 1996	\$9.374	2,126
Florida Forever	\$185.2	85,630
Save Our Everglades Trust Fund	\$90.202	22,829
State, Local and Other Funding Sources ^(a)	\$46.018	13,746
LWCF ^(b)	\$73.154	24,945
TOTALS	\$403.948	149,276

*The fiscal year for the FDEP is July 1 through June 30. The fiscal year for the SFWMD, the FWS, and the NPS is October 1 through September 30.

(a) 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; the category excludes SFMWD acquisition of 1,060 acres utilizing CARL funds.

(b) This category includes all federal funds other than lands acquired with Farm Bill funds.

Biscayne Bay Regional Restoration Coordination Team

An advisory team of federal, state, local, and nongovernmental members was formed in September 2001 to focus on the restoration of Biscayne Bay. The team's *2001 Annual Report* provided a detailed description of the bay's needs and was forwarded to the Florida Legislature by the SFWMD. Based on this report, the legislature allocated \$3.5 million for Biscayne Bay projects.

STRATEGIES FOR SPECIES RECOVERY

Florida Panther Landscape Conservation Strategy

In 2001 a Florida panther subteam completed the mapping and analysis needed to develop a landscape conservation strategy for that species. The information from this analysis will be used to develop guidance for project planning and restoration for ecological communities at the landscape level.

Cheeca Lodge Safe Harbor Agreement

The first safe harbor agreement for Florida was signed between the FWS and the owner of Cheeca Lodge in Islamorada of the Florida Keys in September 2001. It will provide expanded habitat for the endangered Schaus swallowtail

butterfly. Under the agreement, the FWS provided funds to the Cheeca Lodge for the purpose of planting native plants and other rare species to expand habitat of the butterfly. FWS will continue dialogue with Cheeca Lodge staff to assess the effectiveness of the conservation activities.

STRATEGIES AND ACTIVITIES FOR MANAGING INVASIVE EXOTIC PLANTS

Weeds Won't Wait

In 2001 the Noxious Exotic Weed Task Team (NEWTT) completed an assessment of invasive exotic plants in Florida and a strategy for managing them. The strategy, called Weeds Won't Wait, presented to the Task Force in 2002, includes four key principles: prevention, early detection and rapid response, management and control, and integration and coordination. NEWTT is currently developing an implementation plan for the strategy that will highlight individual tasks, agency leads, timetables, and estimated costs.

Loxahatchee National Wildlife Refuge Exotic Management

In keeping with the recent agreement between the SFWMD and the FWS, the FWS is developing a management program for the refuge to address infestations of Old World climbing fern, melaleuca, and other serious invasive exotic

plants. Loxahatchee serves as a point of infestation for surrounding lands. The refuge staff is accelerating efforts to remove invasive exotics.

Exotic Species Quarantine Facility

Construction is now underway on the Invasive Plant Quarantine Facility in Fort Lauderdale, Florida. A commemorative ceremony was held at the site on Earth Day 2002, where leaders from Congress, the Departments of Interior and Agriculture, and the USACE were on hand to recognize the importance of this successful example of interagency coordination and cooperation. The facility's design and construction is being funded by the Department of the Interior, is being built by the USACE and will be operated and maintained by the Department of Agriculture.

The facility is situated on University of Florida property leased to the USDA Agricultural Research Service, Fort Lauderdale Invasive Plant Research Management Laboratory. The center is a 100-acre campus that supports research and instruction related to environmental horticulture, water use, and weed/urban pest control.

Melaleuca Control Program

The fourth revision and update of the *Melaleuca Management Plan* for Florida was completed in 2001. The efforts of many agencies directed through this comprehensive plan have prioritized the expenditure of over \$24 million and removed almost 70 million melaleuca plants (over 100,000 acres) from the Everglades Protection Area. This program was implemented with integrated strategies and long-term systemwide approaches that included the development of biological control agents. Since the release of the first insect, the melaleuca snout beetle (*Oxyops vitiosa*), their populations have increased enormously, and in several of the release sites beetle populations have had dramatic effects on the melaleuca.

In 2002 a second insect (*Boreioglycaspis melaleucae*) was released to address melaleuca. This very small, sap-sucking species imported from

Australia stunts the melaleuca's growth with toxins in its saliva. Scientists believe the combination of the two natural enemies of the melaleuca will help reduce further damage of this invasive exotic plant species.

Removal of Exotic Plants from Big Cypress National Preserve

The Big Cypress National Preserve has been working on removal of exotic plant species, including casuarina, Brazilian pepper, and melaleuca. During 2001, 21,498 acres of exotic vegetation were treated and inspected. The preserve has achieved 90 percent elimination of melaleuca. The preserve staff works in partnership with the Florida State Exotic Pest Management Team and the Dade County Submerged Area Management Team, who have provided approximately \$600,000 to the project. In 2001 the NPS contributed \$280,000 towards removal of exotics.

Goal 3 Accomplishments: Fostering Compatibility of the Built and Natural Systems

COMPATIBLE LAND USE

Acquisition of Parklands

In 2001 the Florida Communities Trust Program provided an estimated \$153 million in grants to the sixteen SFWMD counties, and the cities within those counties, to acquire park, recreation, and open space lands.

Designation of Greenways and Trails

In fiscal year 2000-02 the state added an additional 541,094 acres to the Florida Greenways and Trails System, bringing the total acreage of designated greenways and trails to 544,127 acres. Over the next year, land managers in the Everglades area will be contacted and asked to designate their greenways and trails. The designation of greenways, blueways, and trails multiplies the benefits of open spaces to natural systems and the human environment by ensuring that those spaces will remain linked

together for purposes of habitat connectivity and public access.

Integrated Land Use and Water Supply Planning

Recognizing the critical importance of water to both the built and natural systems, the state passed a law in 2002 that addresses growth management and alternative water supply and requires the comprehensive plans of counties and cities to be coordinated with the regional water supply plans of the state's water management districts.

FLOOD CONTROL AND WATER SUPPLY

State Funding Commitments

The Florida Legislature appropriated \$20 million in 2001 and 2002 to finance flood control projects in Southeast Florida counties.

In 2002 the sixteen counties in the SFWMD received legislative appropriations of \$49 million, or 45 percent of the Florida Legislature's \$107 million statewide appropriation for surface water, stormwater, and wastewater improvement projects. This amount was in addition to funding through the state revolving funds for wastewater and drinking water programs, and the funding of projects by the SFWMD in partnership with local governments.

Flood Control

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 to develop a list of proposed flood mitigation projects for the impacted areas of Miami-Dade County. This group, comprised of SFWMD staff with expertise in engineering, geographic information systems (GIS), emergency management, operations, planning, and local flooding issues, reviewed previous recommendations contained in Miami-Dade County, SFWMD, and USACE reports, and rec-

ommended that mitigation projects should be considered on a basinwide basis and include improvements to both the primary and secondary stormwater conveyance systems. 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 in local communities.

Water Supply

Regional water supply plans with twenty-year planning horizons were completed for each of the four SFWMD regional water supply planning areas: Lower East Coast, Upper East Coast, Kissimmee Valley, and Lower West Coast. A regional water supply planning advisory committee composed of representatives of all interest groups was convened for each planning region to assist in plan development. Funding and implementation schedules for the projects are included in the plans. All plans will be updated every five years.

STRENGTHENED PUBLIC OUTREACH

CERP Outreach and Regional Coordination

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 twelve 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.

In 2001 - 2002 the USACE and the SFWMD moved forward with public outreach activities on both the programmatic and project levels. Program level outreach included efforts in public information, environmental education, and outreach to those communities specifically referenced in WRDA 2000 (i.e., small and minority owned businesses, socially and economically dis-

advantaged communities, and those communities that do not have a high proficiency in the use of the English language.)

On the project level, the USACE and SFWMD outreach activities focused on providing project specific information in forms and through venues that would most effectively meet the needs of interest groups, stakeholders, and the public at large. Efforts to build a database of individuals who might be affected by or interested in each of the individual CERP projects were begun during the 2001-2002 period. Project information was posted regularly on the *evergladesplan.org* website, and project fact sheets were developed and delivered electronically as well as posted on the web. Project level public involvement efforts intensified as project management plans were completed and work initiated on project implementation reports.

In 2001 the working group collaborated with the USACE and the SFWMD to conduct two regional workshops, one in southwest Florida and one in the Kissimmee River basin. Regional Restoration Coordination Teams were formed for these two regions and for Biscayne Bay.

The Museum of Discovery and Science and the Task Force Collaboration Committee

The working group made significant progress in the implementation of the public-private partnership between the Task Force and the Museum of Discovery and Science. The first of three phases of an outreach plan has been successfully initiated, and several projects are being implemented, while the foundation is being built for implementing phases II and III of the plan.

In 2001 significant progress was made on the following components: information dissemination, electronic outreach, school-based education, museum-based education, retrofit of displays and exhibits, and outdoor exhibitry. Maximum use was made of in-kind contributions for information dissemination, electronic outreach, and school- and museum-based education initiatives. Funding for partnership projects was provided through the collaboration of several partners: the Task Force Office of the Executive Director, the FDEP, the U.S. Geological Survey, Everglades National Park, the SFWMD, the Broward County Department of Planning and Environmental Protection, and the Florida Keys National Marine Sanctuary.



Courtesy of SFWMD

Progress Made Toward Restoration, 2001-2002

The ultimate measure of Task Force success will be the restoration of the South Florida ecosystem. The appropriate Task Force agencies are tracking progress toward this end by developing and monitoring approximately 200 indicators of ecosystem health. These indicators, which range from the number of acres of periphyton in Everglades marshes to the frequency of water supply restrictions in urban and agricultural areas, represent the myriad physical, biological, and human elements that are all interrelated as parts of the ecosystem and are all important to ecosystem health. Many of these indicators of ecosystem health represent end results that may take up to fifty years to realize. Interim targets, which focus on earlier indications of successional change, will allow assessment of incremental progress.

The following indicators are a small subset of that much larger set of measures. They have been selected for inclusion in this biennial report because they are currently believed to be among the most indicative of natural system functioning throughout the region as a whole and among the most understandable and meaningful to the American people and the residents of South Florida. These preliminary indicators will be refined as more information is available to identify the best possible measures of ecosystem health for reports to Congress, the state legislature, the councils of the tribes, and the public.

Responding to Congress's direction that the restoration effort be guided by, and continuously adapted to, the best science available, a Restoration Coordination and Verification Team (RECOVER) has been established to support the implementation of the CERP with scientific and technical information. The RECOVER team is developing the majority of the performance measures that will be used to assess restoration progress and to make recommendations over time for adapting to new information. Additional scientific and technical information about areas not covered by the CERP is being developed and refined by other federal, state, and local agencies,

including the FWS, which has developed and is implementing the *Multi-Species Recovery Plan*. The Task Force agencies that are tracking indicators of success provide data to the Task Force, which synthesizes the information for its reports. With the exception of the indicator for threatened and endangered species, which came from the FWS, the following indicators are from the 1999 *Baseline Report for the Comprehensive Everglades Restoration Plan*, prepared by RECOVER.

The following scale has been used to grade progress toward targets for the selected indicators of ecosystem health:

-  Grade I red = No improvement towards target
-  Grade II yellow = Intermediate status
-  Grade III green = Reached / close to target

Progress in these indicators and the hundreds of other measures of ecosystem health will reinforce the current scientific judgments about what actions are needed to restore health to the ecosystem. If these indicators do not show incremental progress, the efforts will need to be reevaluated. That is the essential link between the ultimate result of ecosystem restoration and the specific work goals and subgoals established by the Task Force.

Indicators of Total System Health

THREATENED AND ENDANGERED SPECIES

Target

Improved status for fourteen federally listed threatened or endangered species, and no declines in status for those additional species listed by the state, by 2020.

Recent Status and Trends

One particular species benefiting from recent acquisition efforts is the endangered American crocodile. Acquisitions have increased the amount of potential habitat such that, in addition to many other factors that are considered as a species improves, the crocodile is being proposed to have its status reclassified from endangered to threatened.



Grade II yellow

NESTING WADING BIRDS

Target

A minimum annual average of 10,000 nesting pairs of great egrets, 15,000 pairs of snowy egrets and tricolored herons, combined 25,000 pairs of white ibis, and 5,000 pairs of wood storks.

Recent Status and Trends

In 2001 the total number of nesting pairs for the five species in the Everglades was

- 5,450 great egret pairs
- 3,600 snowy egret pairs
- 2,200 tricolored heron pairs
- 17,300 white ibis pairs
- 2,050 wood stork pairs
- 30,600 total pairs

The total numbers of nesting birds in the Everglades for the past three years, 1999 – 2001, has been higher than for almost any year from the late 1970s through 1998. The total numbers for these three years were about 40-60 percent of the CERP restoration goal. Nesting success in 2001, however, was poor. Exceptionally dry conditions during the late dry season resulted in high levels of nesting failures in WCA-2 and WCA-3; for example, there were 65 percent and 80 percent failures among ibis and storks. No progress was made in 1999-2001 in recovering

the traditional estuarine nesting colonies; only 1.6 to 4 percent of the wading birds that nested in the Greater Everglades used the estuarine sites. No storks nested at Corkscrew Swamp Sanctuary in 2001, the major stork nesting site in South Florida. Storks in the Everglades in 2001, presumably stimulated by the rapid drying, began nesting in January and February.



Grade II yellow

Although not influenced by CERP, the total number of nesting pairs for the five indicator species in 2001 was substantially higher than the number of pairs during a base line period, 1986-1995. Little progress was made in 2001 towards meeting the goals for colony location and timing patterns for nesting birds.

URBAN AND AGRICULTURAL WATER SUPPLY

Target

Meet urban and agricultural water supply needs in all years up to and including those years with droughts with a one-in-ten-year return frequency.

Recent Status and Trends

For the most recent nineteen-year period, the regional water supply system has been unable to meet all reasonable, beneficial demands. Water use restrictions have been imposed during five of the nineteen years in the Lake Okeechobee and Upper East Coast service areas, and during four of those years in the Lower East Coast service area. Although rainfall deficiencies during some of these years were at levels that were more severe than a one-in-ten-year frequency event, the total number of years with water restrictions was greater than the targeted frequency.



Grade II yellow

Interpretation of the most recent nineteen-year period of years is made uncertain by the fact that some years during the early 1990s experienced very low rainfall amounts, and by the difficulties in determining the level of a drought at large regional scales. Also, a nineteen-year period is insufficient to show the full

range of water supply conditions that may exist with current management practices. Nevertheless, the nineteen-year record and the modeling predictions suggest that the current water supply system is not meeting the one-in-ten-year level of service target in some areas. Additional storage is needed.

Indicators of Lake Okeechobee Health

SUBMERGED AQUATIC VEGETATION

Target

Sustain at least 40,000 acres of total submerged vegetation, including benthic macro-algae, around the shoreline of Lake Okeechobee on an ongoing basis, and of that total have at least 20,000 acres of rooted plants, in particular, eelgrass and peppergrass.

Recent Status and Trends

When the spatial extent of the submerged aquatic vegetation was measured coincident with a low lake stage and regional drought in 1989-90, over 50,000 acres was found. By 1992 the spatial extent had declined somewhat, and after many years of high lake depths, only 3,000 acres remained. A detailed survey in 2000, conducted immediately after a managed lake drawdown, indicated that the community had recovered to nearly 45,000 acres. Much of the submerged vegetation was lost when an extreme drought in 2001 dried up most of the lakeshore and dropped water levels below nine feet, a historic low for this lake. However, in late summer 2001, approximately six weeks after lake levels increased to over twelve feet, the submerged community began to recover. At the end of the 2001 summer growing season (September) the lake supported approximately 34,000 acres of submerged plants.



Grade I red

There was no improvement until 2000, when the SFWMD lowered the lake in a managed drawdown, allowing the vegetation to recover. Projects are not yet in place to ensure long-term survival of large beds of submerged aquatic vegetation in the lake.

Indicators of Estuary Health

OYSTER BEDS IN THE ST. LUCIE ESTUARY

Target

Increase the aerial extent of healthy oyster beds in the St. Lucie Estuary to approximately 900 acres.

Recent Status and Trends

A field survey conducted in 1997 identified approximately 209 acres of oyster beds remaining in the St. Lucie Estuary. Large freshwater discharges from the watershed create stressful conditions for the remaining oysters on an almost annual basis. Regulatory releases from Lake Okeechobee, which can turn the estuary into a virtually freshwater system and kill up to 90 percent of the remaining oyster beds in the mid-estuary, occur on an average of every six to seven years.



Grade I red

No elements of the CERP have been implemented, and no increase in oysters has occurred.

ROSEATE SPOONBILLS

Target

- (1) Recover and stabilize the Florida Bay nesting population to at least 1,000 pairs annually distributed throughout the bay, including doubling of the number of pairs nesting in northeast Florida Bay from the current 125 to 250 pairs.
- (2) Recover some level of nesting by spoonbills in the coastal zone of the southwestern gulf coast between Lostman's River and the Caloosahatchee River estuary.

Recent Status and Trends

While lower than the peak number of nesting spoonbills in the late 1970s, the number of nesting birds in Florida Bay has fluctuated in the range of 500-750 pairs during most of the

1990s, with no obvious trend either of increase or decline. No nesting spoonbills have returned to the southwestern gulf coast.



Grade I red

No elements of the CERP have been implemented, and no improvements in nesting patterns by spoonbills are apparent.

Indicators of the Health of the Everglades Ridge and Slough

TREE ISLANDS

Target

No further degradation of tree islands, and recovery of as much as possible of the number and acreage of islands present in WCA-2 and WCA-3 in 1940

Recent Status and Trends

Comparisons of the number, size, and distribution of tree islands between 1940 and 1995 in WCA- 2A show that only four of the original fifty-eight tree islands have survived the past fifty-five years. Three of the four remaining islands are stressed and continue to lose trees. Similar comparisons for WCA-3A and WCA-3B show a reduction from 1,041 to 577 tree islands (a 45 percent reduction), and a reduction in total acreage of tree islands from 24,700 to 8,600 acres (a 65 percent reduction).

The relatively high water conditions from 1995 to 1999 were a stress on tree islands. The relatively dry years of 2000 and 2001 could have been catastrophic. Despite the 2001 drought, levels in the water conservation areas were actually 0.4 to 0.7 feet higher than the 32-year average. This was due to the fact that the dry conditions were good for hardwood seed germination and sapling development. Sapling survival will depend upon the amount of tree island soil oxidation (and hence elevation loss) relative to the return of high waters during the 2001-2002 wet season.



Grade I red

Currently, there is no evidence that the decline in tree islands has abated.

Indicators of Florida Bay Health

SEAGRASS BEDS

Target

Coverage of 65-70 percent of Florida Bay with high quality seagrass beds distributed throughout the bay.

Recent Status and Trends

Annual seagrass surveys began in 1994. Little improvement occurred until 1998-1999, when the overall health of the seagrass beds was better. During the past two years the baywide coverage has improved to approximately 40 percent. The recent improvement included some recovery from the die-off and was partly due to increased fresh-water inflows from the mainland because of high rainfall and to improved water management practices in the C-111 and Taylor Slough basins.



Grade II yellow

Seagrass beds are showing evidence of recovery to 40 percent of the bay.

COMMERCIAL PINK SHRIMP HARVESTS

Target

A long-term average rate of commercial harvest of pink shrimp on the Dry Tortugas fishing grounds that equals or exceeds 600 pounds per vessel-day, and an amount of large shrimp in the long-term average catch exceeding 500 pounds per vessel.

Recent Status and Trends

A severe decline in Tortugas pink shrimp catches and catch rates occurred during the 1980s and 1990s. Landings declined sharply beginning in

1985-86 and remained at historic lows through 1992-93. Catch per unit effort was greater than 500 pounds per vessel-day in every year prior to 1983-84, but from 1983-84 through 1991-92, the catch rate was less than 500 pounds per vessel day in five out of nine years. The long-term average catch of large sized shrimp declined from 480 pounds per vessel for the years 1961-1981 to 340 pounds for the years 1985-1995. The shrimp harvest has partially recovered since the mid-1990s, probably in response to several years of above average rainfall.

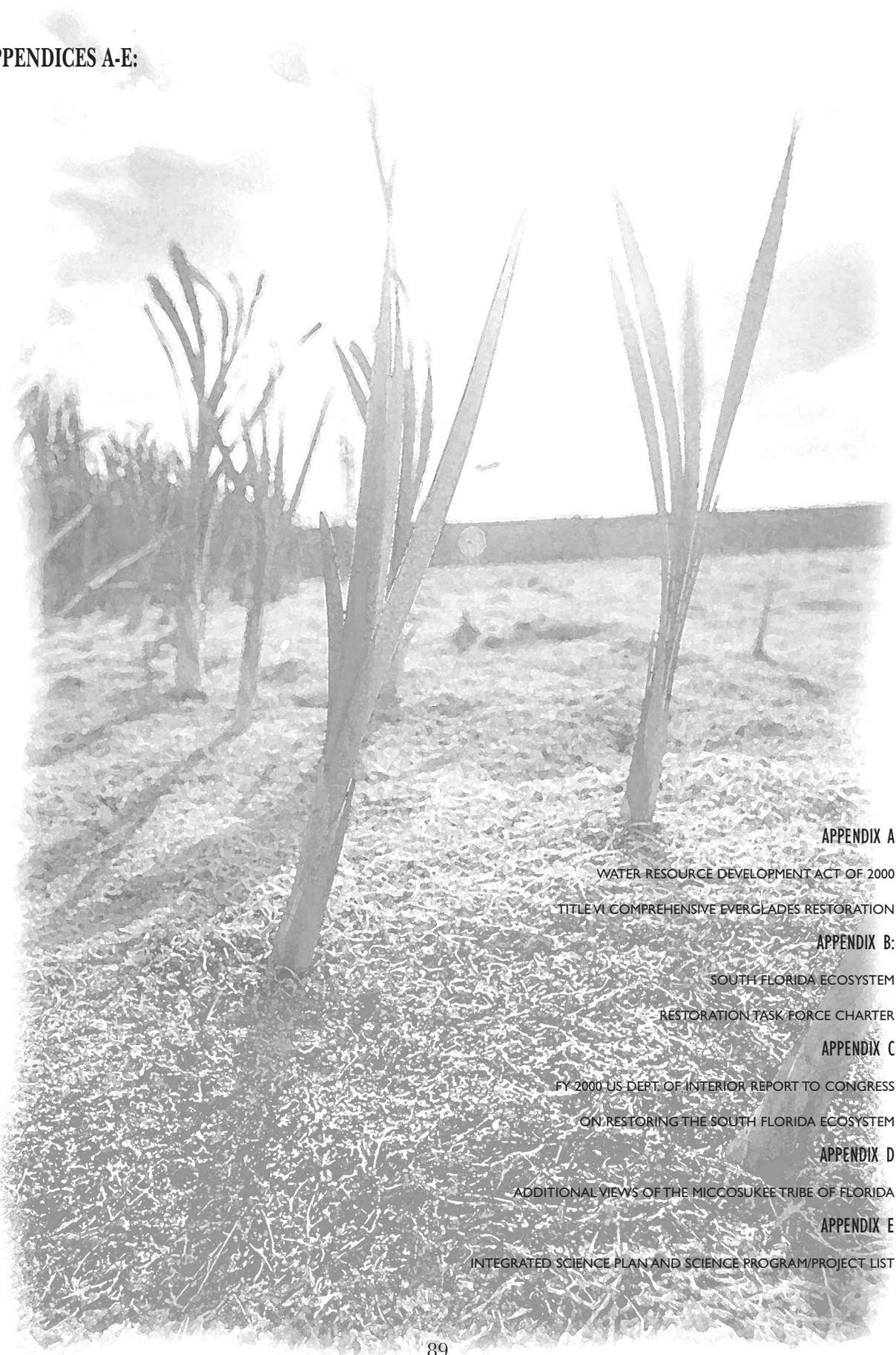


Grade II yellow

The current status of the pink shrimp harvest on the Tortugas fishing grounds is mid-way between the low harvests of 1984-1991 and the higher harvests prior to 1984. Elements of the CERP expected to affect this status have not yet been implemented.

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APPENDICES A-E:



APPENDIX A

WATER RESOURCE DEVELOPMENT ACT OF 2000
TITLE VI COMPREHENSIVE EVERGLADES RESTORATION

APPENDIX B:

SOUTH FLORIDA ECOSYSTEM
RESTORATION TASK FORCE CHARTER

APPENDIX C

FY 2000 US DEPT. OF INTERIOR REPORT TO CONGRESS
ON RESTORING THE SOUTH FLORIDA ECOSYSTEM

APPENDIX D

ADDITIONAL VIEWS OF THE MICCOSUKEE TRIBE OF FLORIDA

APPENDIX E

INTEGRATED SCIENCE PLAN AND SCIENCE PROGRAM/PROJECT LIST

Appendix A: Water Resources Development Act of 2000

Title VI Comprehensive Everglades Restoration

WATER RESOURCES DEVELOPMENT ACT 2000 SECTION 601 COMPREHENSIVE EVERGLADES RESTORATION PLAN

TITLE VI—COMPREHENSIVE EVERGLADES RESTORATION

Sec. 601. Comprehensive Everglades restoration plan.
Sec. 602. Sense of Congress concerning Homestead Air
Force Base.

SEC. 601. COMPREHENSIVE EVERGLADES RESTORATION PLAN.

(a) DEFINITIONS- In this section, the following definitions
apply:

(1) CENTRAL AND SOUTHERN FLORIDA PRO-
JECT-

(A) IN GENERAL- The term 'Central and
Southern Florida Project' means the project for
Central and Southern Florida authorized under the
heading 'CENTRAL AND SOUTHERN FLORI-
DA' in section 203 of the Flood Control Act of
1948 (62 Stat. 1176).

(B) INCLUSION- The term 'Central and
Southern Florida Project' includes any modification
to the project authorized by this section or any
other provision of law.

(2) GOVERNOR- The term 'Governor' means the
Governor of the State of Florida.

(3) NATURAL SYSTEM-

(A) IN GENERAL- The term 'natural system'
means all land and water managed by the Federal
Government or the State within the South Florida
ecosystem.

(B) INCLUSIONS- The term 'natural system'
includes—

- (i) water conservation areas;
- (ii) sovereign submerged land;
- (iii) Everglades National Park;
- (iv) Biscayne National Park;
- (v) Big Cypress National Preserve;
- (vi) other Federal or State (including a political
subdivision of a
State) land that is designated and managed for
conservation
purposes; and
- (vii) any tribal land that is designated and
managed for
conservation purposes, as approved by the
tribe.

(4) PLAN- The term 'Plan' means the Comprehensive
Everglades Restoration Plan contained in the 'Final
Integrated Feasibility Report and Programmatic

Environmental Impact Statement', dated April 1, 1999,
as modified by this section.

(5) SOUTH FLORIDA ECOSYSTEM-

(A) IN GENERAL- The term 'South Florida
ecosystem' means the area consisting of the land
and water within the boundary of the South
Florida Water Management District in effect on
July 1, 1999.

(B) INCLUSIONS- The term 'South Florida
ecosystem' includes—

- (i) the Everglades;
- (ii) the Florida Keys; and
- (iii) the contiguous near-shore coastal water of
South Florida.

(6) STATE- The term 'State' means the State
of Florida.

(b) COMPREHENSIVE EVERGLADES
RESTORATION PLAN-

(1) APPROVAL-

(A) IN GENERAL- Except as modified by this sec-
tion, the Plan is approved as a framework for modi-
fications and operational changes to the Central
and Southern Florida Project that are needed to
restore, preserve, and protect the South Florida
ecosystem while providing for other water-related
needs of the region, including water supply and
flood protection. The Plan shall be implemented to
ensure the protection of water quality in, the
reduction of the loss of fresh water from, and the
improvement of the environment of the South
Florida ecosystem and to achieve and maintain the
benefits to the natural system and human environ-
ment described in the Plan, and required pursuant
to this section, for as long as the project is author-
ized.

(B) INTEGRATION- In carrying out the Plan, the
Secretary shall integrate the activities described in
subparagraph (A) with ongoing Federal and State
projects and activities in accordance with section
528(c) of the Water Resources Development Act of
1996 (110 Stat. 3769). Unless specifically provided
herein, nothing in this section shall be construed to
modify any existing cost share or responsibility for
projects as listed in subsection (c) or (e) of section
528 of the Water Resources Development Act of
1996 (110 Stat. 3769).

(2) SPECIFIC AUTHORIZATIONS-

(A) IN GENERAL-

(i) PROJECTS- The Secretary shall carry out the
projects included in the Plan in accordance with
subparagraphs (B), (C), (D), and (E).

(ii) CONSIDERATIONS- In carrying out activities
described in the Plan, the Secretary shall—

- (I) take into account the protection of water quality by considering applicable State water quality standards; and
- (II) include such features as the Secretary determines are necessary to ensure that all ground water and surface water discharges from any project feature authorized by this subsection will meet all applicable water quality standards and applicable water quality permitting requirements.
- (iii) REVIEW AND COMMENT- In developing the projects authorized under subparagraph (B), the Secretary shall provide for public review and comment in accordance with applicable Federal law.
- (B) PILOT PROJECTS- The following pilot projects are authorized for implementation, after review and approval by the Secretary, at a total cost of \$69,000,000, with an estimated Federal cost of \$34,500,000 and an estimated non-Federal cost of \$34,500,000:
- (i) Caloosahatchee River (C-43) Basin ASR, at a total cost of \$6,000,000, with an estimated Federal cost of \$3,000,000 and an estimated non-Federal cost of \$3,000,000.
 - (ii) Lake Belt In-Ground Reservoir Technology, at a total cost of \$23,000,000, with an estimated Federal cost of \$11,500,000 and an estimated non-Federal cost of \$11,500,000.
 - (iii) L-31N Seepage Management, at a total cost of \$10,000,000, with an estimated Federal cost of \$5,000,000 and an estimated non-Federal cost of \$5,000,000.
 - (iv) Wastewater Reuse Technology, at a total cost of \$30,000,000, with an estimated Federal cost of \$15,000,000 and an estimated non-Federal cost of \$15,000,000.
- (C) INITIAL PROJECTS- The following projects are authorized for implementation, after review and approval by the Secretary, subject to the conditions stated in subparagraph (D), at a total cost of \$1,100,918,000, with an estimated Federal cost of \$550,459,000 and an estimated non-Federal cost of \$550,459,000:
- (i) C-44 Basin Storage Reservoir, at a total cost of \$112,562,000, with an estimated Federal cost of \$56,281,000 and an estimated non-Federal cost of \$56,281,000.
 - (ii) Everglades Agricultural Area Storage Reservoirs—Phase I, at a total cost of \$233,408,000, with an estimated Federal cost of \$116,704,000 and an estimated non-Federal cost of \$116,704,000.
 - (iii) Site 1 Impoundment, at a total cost of \$38,535,000, with an estimated Federal cost of \$19,267,500 and an estimated non-Federal cost of \$19,267,500.
 - (iv) Water Conservation Areas 3A/3B Levee Seepage Management, at a total cost of \$100,335,000, with an estimated Federal cost of \$50,167,500 and an estimated non-Federal cost of \$50,167,500.
 - (v) C-11 Impoundment and Stormwater Treatment Area, at a total cost of \$124,837,000, with an estimated Federal cost of \$62,418,500 and an estimated non-Federal cost of \$62,418,500.
 - (vi) C-9 Impoundment and Stormwater Treatment Area, at a total cost of \$89,146,000, with an estimated Federal cost of \$44,573,000 and an estimated non-Federal cost of \$44,573,000.
 - (vii) Taylor Creek/Nubbin Slough Storage and Treatment Area, at a total cost of \$104,027,000, with an estimated Federal cost of \$52,013,500 and an estimated non-Federal cost of \$52,013,500.
 - (viii) Raise and Bridge East Portion of Tamiami Trail and Fill Miami Canal within Water Conservation Area 3, at a total cost of \$26,946,000, with an estimated Federal cost of \$13,473,000 and an estimated non-Federal cost of \$13,473,000.
 - (ix) North New River Improvements, at a total cost of \$77,087,000, with an estimated Federal cost of \$38,543,500 and an estimated non-Federal cost of \$38,543,500.
 - (x) C-111 Spreader Canal, at a total cost of \$94,035,000, with an estimated Federal cost of \$47,017,500 and an estimated non-Federal cost of \$47,017,500.
 - (xi) Adaptive Assessment and Monitoring Program, at a total cost of \$100,000,000, with an estimated Federal cost of \$50,000,000 and an estimated non-Federal cost of \$50,000,000.
- (D) CONDITIONS-
- (i) PROJECT IMPLEMENTATION REPORTS- Before implementation of a project described in any of clauses (i) through (x) of subparagraph (C), the Secretary shall review and approve for the project a project implementation report prepared in accordance with subsections (f) and (h).
 - (ii) SUBMISSION OF REPORT- The Secretary shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate the project implementation report required by subsections (f) and (h) for each project under this paragraph (including all relevant data and information on all costs).
 - (iii) FUNDING CONTINGENT ON APPROVAL- No appropriation shall be made to construct any project under this paragraph if the project implementation report for the project has not been approved by resolutions adopted by the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate.
 - (iv) MODIFIED WATER DELIVERY- No appropriation shall be made to construct the Water Conservation Area 3 Decentralization and Sheetflow Enhancement Project (including component AA, Additional S-345 Structures; component

QQ Phase 1, Raise and Bridge East Portion of Tamiami Trail and Fill Miami Canal within WCA 3; component QQ Phase 2, WCA 3 Decompartmentalization and Sheetflow Enhancement; and component SS, North New River Improvements) or the Central Lakebelt Storage Project (including components S and EEE, Central Lake Belt Storage Area) until the completion of the project to improve water deliveries to Everglades National Park authorized by section 104 of the Everglades National Park Protection and Expansion Act of 1989 (16 U.S.C. 410r-8).

(E) **MAXIMUM COST OF PROJECTS-** Section 902 of the Water Resources Development Act of 1986 (33 U.S.C. 2280) shall apply to each project feature authorized under this subsection.

(c) **ADDITIONAL PROGRAM AUTHORITY**

(1) **IN GENERAL-** To expedite implementation of the Plan, the Secretary may implement modifications to the Central and Southern Florida Project that—

(A) are described in the Plan; and

(B) will produce a substantial benefit to the restoration, preservation and protection of the South Florida ecosystem.

(2) **PROJECT IMPLEMENTATION REPORTS-** Before implementation of any project feature authorized under this subsection, the Secretary shall review and approve for the project feature a project implementation report prepared in accordance with subsections (f) and (h).

(3) **FUNDING-**

(A) **INDIVIDUAL PROJECT FUNDING-**

(i) **FEDERAL COST-** The total Federal cost of each project carried out under this subsection shall not exceed \$12,500,000.

(ii) **OVERALL COST-** The total cost of each project carried out under this subsection shall not exceed \$25,000,000.

(B) **AGGREGATE COST-** The total cost of all projects carried out under this subsection shall not exceed \$206,000,000, with an estimated Federal cost of \$103,000,000 and an estimated non-Federal cost of \$103,000,000.

(d) **AUTHORIZATION OF FUTURE PROJECTS-**

(1) **IN GENERAL-** Except for a project authorized by subsection (b) or (c), any project included in the Plan shall require a specific authorization by Congress.

(2) **SUBMISSION OF REPORT-** Before seeking congressional authorization for a project under paragraph (1), the Secretary shall submit to Congress—

(A) a description of the project; and

(B) a project implementation report for the project prepared in accordance with subsections (f) and (h).

(e) **COST SHARING-**

(1) **FEDERAL SHARE-** The Federal share of the cost of carrying out a project authorized by subsection (b), (c), or (d)

shall be 50 percent.

(2) **NON-FEDERAL RESPONSIBILITIES-** The non-Federal sponsor with respect to a project described in subsection (b), (c), or (d), shall be—

(A) responsible for all land, easements, rights-of-way, and relocations necessary to implement the Plan; and

(B) afforded credit toward the non-Federal share of the cost of carrying out the project in accordance with paragraph (5)(A).

(3) **FEDERAL ASSISTANCE-**

(A) **IN GENERAL-** The non-Federal sponsor with respect to a project authorized by subsection (b), (c), or (d) may use Federal funds for the purchase of any land, easement, rights-of-way, or relocation that is necessary to carry out the project if any funds so used are credited toward the Federal share of the cost of the project.

(B) **AGRICULTURE FUNDS-** Funds provided to the non-Federal sponsor under the Conservation Restoration and Enhancement Program (CREP) and the Wetlands Reserve Program (WRP) for projects in the Plan shall be credited toward the non-Federal share of the cost of the Plan if the Secretary of Agriculture certifies that the funds provided may be used for that purpose. Funds to be credited do not include funds provided under section 390 of the Federal Agriculture Improvement and Reform Act of 1996 (110 Stat. 1022).

(4) **OPERATION AND MAINTENANCE-** Notwithstanding section 528(e)(3) of the Water Resources Development Act of 1996 (110 Stat. 3770), the non-

Federal sponsor shall be responsible for 50 percent of the cost of operation, maintenance, repair, replacement, and rehabilitation activities authorized under this section.

Furthermore, the Seminole Tribe of Florida shall be responsible for 50 percent of the cost of operation, maintenance, repair, replacement, and rehabilitation activities for the Big Cypress Seminole Reservation Water Conservation Plan Project.

(5) **CREDIT-**

(A) **IN GENERAL-** Notwithstanding section 528(e)(4) of the Water Resources Development Act of 1996 (110 Stat. 3770) and regardless of the date of acquisition, the value of lands or interests in lands and incidental costs for land acquired by a non-Federal sponsor in accordance with a project implementation report for any project included in the Plan and authorized by Congress shall be—

(i) included in the total cost of the project; and

(ii) credited toward the non-Federal share of the cost of the project.

(B) **WORK-** The Secretary may provide credit, including in-kind credit, toward the non-Federal share for the reasonable cost of any work performed in connection with a study, preconstruction engineering and design, or construction that is necessary

for the implementation of the Plan if—

- (i)(I) the credit is provided for work completed during the period of design, as defined in a design agreement between the Secretary and the non-Federal sponsor; or
- (II) the credit is provided for work completed during the period of construction, as defined in a project cooperation agreement for an authorized project between the Secretary and the non-Federal sponsor;
- (ii) the design agreement or the project cooperation agreement prescribes the terms and conditions of the credit; and
- (iii) the Secretary determines that the work performed by the non-Federal sponsor is integral to the project.

(C) TREATMENT OF CREDIT BETWEEN

PROJECTS- Any credit provided under this paragraph may be carried over between authorized projects in accordance with subparagraph (D).

(D) PERIODIC MONITORING-

- (i) **IN GENERAL-** To ensure that the contributions of the non-Federal sponsor equal 50 percent proportionate share for projects in the Plan, during each 5-year period, beginning with commencement of design of the Plan, the Secretary shall, for each project—

- (I) monitor the non-Federal provision of cash, in-kind services, and land; and
- (II) manage, to the maximum extent practicable, the requirement of the non-Federal sponsor to provide cash, in-kind services, and land.

- (ii) **OTHER MONITORING-** The Secretary shall conduct monitoring under clause (i) separately for the preconstruction engineering and design phase and the construction phase.

(E) AUDITS- Credit for land (including land value and incidental costs) or work provided under this subsection shall be subject to audit by the Secretary.

(f) EVALUATION OF PROJECTS-

(1) **IN GENERAL-** Before implementation of a project authorized by subsection (c) or (d) or any of clauses (i) through (x) of subsection (b)(2)(C), the Secretary, in cooperation with the non-Federal sponsor, shall complete, after notice and opportunity for public comment and in accordance with subsection (h), a project implementation report for the project.

(2) PROJECT JUSTIFICATION-

(A) IN GENERAL- Notwithstanding section 209 of the Flood Control Act of 1970 (42 U.S.C. 1962-2) or any other provision of law, in carrying out any activity authorized under this section or any other provision of law to restore, preserve, or protect the South Florida ecosystem, the Secretary may determine that—

- (i) the activity is justified by the environmental benefits derived by the South Florida ecosys-

tem; and

- (ii) no further economic justification for the activity is required, if the Secretary determines that the activity is cost-effective.

(B) APPLICABILITY- Subparagraph (A) shall not apply to any separable element intended to produce benefits that are predominantly unrelated to the restoration, preservation, and protection of the natural system.

(g) EXCLUSIONS AND LIMITATIONS- The following Plan components are not approved for implementation:

(1) WATER INCLUDED IN THE PLAN-

(A) IN GENERAL- Any project that is designed to implement the capture and use of the approximately 245,000 acre-feet of water described in section 7.7.2 of the Plan shall not be implemented until such time as—

- (i) the project-specific feasibility study described in subparagraph (B) on the need for and physical delivery of the approximately 245,000 acre-feet of water; conducted by the Secretary, in cooperation with the non-Federal sponsor, is completed;
- (ii) the project is favorably recommended in a final report of the Chief of Engineers; and
- (iii) the project is authorized by Act of Congress.

(B) PROJECT-SPECIFIC FEASIBILITY STUDY- The project-specific feasibility study referred to in subparagraph (A) shall include—

- (i) a comprehensive analysis of the structural facilities proposed to deliver the approximately 245,000 acre-feet of water to the natural system;
- (ii) an assessment of the requirements to divert and treat the water;
- (iii) an assessment of delivery alternatives;
- (iv) an assessment of the feasibility of delivering the water downstream while maintaining current levels of flood protection to affected property; and
- (v) any other assessments that are determined by the Secretary to be necessary to complete the study.

(2) WASTEWATER REUSE-

(A) IN GENERAL- On completion and evaluation of the wastewater reuse pilot project described in subsection (b)(2)(B)(iv), the Secretary, in an appropriately timed 5-year report, shall describe the results of the evaluation of advanced wastewater reuse in meeting, in a cost-effective manner, the requirements of restoration of the natural system.

(B) SUBMISSION- The Secretary shall submit to Congress the report described in subparagraph (A) before congressional authorization for advanced wastewater reuse is sought.

(3) PROJECTS APPROVED WITH LIMITATIONS-

The following projects in the Plan are approved for implementation with limitations:

(A) LOXAHATCHEE NATIONAL WILDLIFE REFUGE- The Federal share for land acquisition in the project to enhance existing wetland systems along the Loxahatchee National Wildlife Refuge, including the Stazzulla tract, should be funded through the budget of the Department of the Interior.

(B) SOUTHERN CORKSCREW REGIONAL ECOSYSTEM- The Southern Corkscrew regional ecosystem watershed addition should be accomplished outside the scope of the Plan.

(h) ASSURANCE OF PROJECT BENEFITS-

(1) IN GENERAL- The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Plan shall be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, the improvement of the environment of the South Florida Ecosystem and to achieve and maintain the benefits to the natural system and human environment described in the Plan, and required pursuant to this section, for as long as the project is authorized.

(2) AGREEMENT-

(A) IN GENERAL- In order to ensure that water generated by the Plan will be made available for the restoration of the natural system, no appropriations, except for any pilot project described in subsection (b)(2)(B), shall be made for the construction of a project contained in the Plan until the President and the Governor enter into a binding agreement under which the State shall ensure, by regulation or other appropriate means, that water made available by each project in the Plan shall not be permitted for a consumptive use or otherwise made unavailable by the State until such time as sufficient reservations of water for the restoration of the natural system are made under State law in accordance with the project implementation report for that project and consistent with the Plan.

(B) ENFORCEMENT-

(i) IN GENERAL- Any person or entity that is aggrieved by a failure of the United States or any other Federal Government instrumentality or agency, or the Governor or any other officer of a State instrumentality or agency, to comply with any provision of the agreement entered into under subparagraph (A) may bring a civil action in United States district court for an injunction directing the United States or any other Federal Government instrumentality or agency or the Governor or any other officer of a State instrumentality or agency, as the case may be, to comply with the agreement.

(ii) LIMITATIONS ON COMMENCEMENT OF CIVIL ACTION- No civil action may be

commenced under clause (i)—

(I) before the date that is 60 days after the Secretary and the Governor receive written notice of a failure to comply with the agreement; or

(II) if the United States has commenced and is diligently prosecuting an action in a court of the United States or a State to redress a failure to comply with the agreement.

(C) TRUST RESPONSIBILITIES- In carrying out his responsibilities under this subsection with respect to the restoration of the South Florida ecosystem, the Secretary of the Interior shall fulfill his obligations to the Indian tribes in South Florida under the Indian trust doctrine as well as other applicable legal obligations.

(3) PROGRAMMATIC REGULATIONS-

(A) ISSUANCE- Not later than 2 years after the date of enactment of this Act, the Secretary shall, after notice and opportunity for public comment, with the concurrence of the Governor and the Secretary of the Interior, and in consultation with the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the Administrator of the Environmental Protection Agency, the Secretary of Commerce, and other Federal, State, and local agencies, promulgate programmatic regulations to ensure that the goals and purposes of the Plan are achieved.

(B) CONCURRENCY STATEMENT- The Secretary of the Interior and the Governor shall, not later than 180 days from the end of the public comment period on proposed programmatic regulations, provide the Secretary with a written statement of concurrence or nonconcurrence. A failure to provide a written statement of concurrence or nonconcurrence within such time frame will be deemed as meeting the concurrency requirements of subparagraph (A)(i). A copy of any concurrency or nonconcurrence statements shall be made a part of the administrative record and referenced in the final programmatic regulations. Any nonconcurrence statement shall specifically detail the reason or reasons for the nonconcurrence.

(C) CONTENT OF REGULATIONS-

(i) IN GENERAL- Programmatic regulations promulgated under this paragraph shall establish a process—

(I) for the development of project implementation reports, project cooperation agreements, and operating manuals that ensure that the goals and objectives of the Plan are achieved;

(II) to ensure that new information resulting from changed or unforeseen circumstances, new scientific or technical information or information that is developed through the principles of adaptive management contained in the Plan, or future authorized changes to the Plan are integrated into the implementation of the Plan; and

- (III) to ensure the protection of the natural system consistent with the goals and purposes of the Plan, including the establishment of interim goals to provide a means by which the restoration success of the Plan may be evaluated throughout the implementation process.
- (ii) **LIMITATION ON APPLICABILITY OF PROGRAMMATIC REGULATIONS-** Programmatic regulations promulgated under this paragraph shall expressly prohibit the requirement for concurrence by the Secretary of the Interior or the Governor on project implementation reports, project cooperation agreements, operating manuals for individual projects undertaken in the Plan, and any other documents relating to the development, implementation, and management of individual features of the Plan, unless such concurrence is provided for in other Federal or State laws.
- (D) **SCHEDULE AND TRANSITION RULE-**
- (i) **IN GENERAL-** All project implementation reports approved before the date of promulgation of the programmatic regulations shall be consistent with the Plan.
- (ii) **PREAMBLE-** The preamble of the programmatic regulations shall include a statement concerning the consistency with the programmatic regulations of any project implementation reports that were approved before the date of promulgation of the regulations.
- (E) **REVIEW OF PROGRAMMATIC REGULATIONS-** Whenever necessary to attain Plan goals and purposes, but not less often than every 5 years, the Secretary, in accordance with subparagraph (A), shall review the programmatic regulations promulgated under this paragraph.
- (4) **PROJECT-SPECIFIC ASSURANCES-**
- (A) **PROJECT IMPLEMENTATION REPORTS-**
- (i) **IN GENERAL-** The Secretary and the non-Federal sponsor shall develop project implementation reports in accordance with section 10.3.1 of the Plan.
- (ii) **COORDINATION-** In developing a project implementation report, the Secretary and the non-Federal sponsor shall coordinate with appropriate Federal, State, tribal, and local governments.
- (iii) **REQUIREMENTS-** A project implementation report shall—
- (I) be consistent with the Plan and the programmatic regulations promulgated under paragraph (3);
- (II) describe how each of the requirements stated in paragraph (3)(B) is satisfied;
- (III) comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.);
- (IV) identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;
- (V) identify the amount of water to be reserved or allocated for the natural system necessary to implement, under State law, subclauses (IV) and (VI);
- (VI) comply with applicable water quality standards and applicable water quality permitting requirements under subsection (b)(2)(A)(ii);
- (VII) be based on the best available science; and
- (VIII) include an analysis concerning the cost-effectiveness and engineering feasibility of the project.
- (B) **PROJECT COOPERATION AGREEMENTS-**
- (i) **IN GENERAL-** The Secretary and the non-Federal sponsor shall execute project cooperation agreements in accordance with section 10 of the Plan.
- (ii) **CONDITION-** The Secretary shall not execute a project cooperation agreement until any reservation or allocation of water for the natural system identified in the project implementation report is executed under State law.
- (C) **OPERATING MANUALS-**
- (i) **IN GENERAL-** The Secretary and the non-Federal sponsor shall develop and issue, for each project or group of projects, an operating manual that is consistent with the water reservation or allocation for the natural system described in the project implementation report and the project cooperation agreement for the project or group of projects.
- (ii) **MODIFICATIONS-** Any significant modification by the Secretary and the non-Federal sponsor to an operating manual after the operating manual is issued shall only be carried out subject to notice and opportunity for public comment.
- (5) **SAVINGS CLAUSE-**
- (A) **NO ELIMINATION OR TRANSFER-** Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer existing legal sources of water, including those for—
- (i) an agricultural or urban water supply;
- (ii) allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
- (iii) the Miccosukee Tribe of Indians of

- Florida;
- (iv) water supply for Everglades National Park; or
 - (v) water supply for fish and wildlife.
- (B) **MAINTENANCE OF FLOOD PROTECTION**- Implementation of the Plan shall not reduce levels of service for flood protection that are—
- (i) in existence on the date of enactment of this Act; and
 - (ii) in accordance with applicable law.
- (C) **NO EFFECT ON TRIBAL COMPACT**- Nothing in this section amends, alters, prevents, or otherwise abrogates rights of the Seminole Indian Tribe of Florida under the compact among the Seminole Tribe of Florida, the State, and the South Florida Water Management District, defining the scope and use of water rights of the Seminole Tribe of Florida, as codified by section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e).
- (i) **DISPUTE RESOLUTION**-
- (1) **IN GENERAL**- The Secretary and the Governor shall within 180 days from the date of enactment of this Act develop an agreement for resolving disputes between the Corps of Engineers and the State associated with the implementation of the Plan. Such agreement shall establish a mechanism for the timely and efficient resolution of disputes, including—
 - (A) a preference for the resolution of disputes between the Jacksonville District of the Corps of Engineers and the South Florida Water Management District;
 - (B) a mechanism for the Jacksonville District of the Corps of Engineers or the South Florida Water Management District to initiate the dispute resolution process for unresolved issues;
 - (C) the establishment of appropriate timeframes and intermediate steps for the elevation of disputes to the Governor and the Secretary; and (D) a mechanism for the final resolution of disputes, within 180 days from the date that the dispute resolution process is initiated under subparagraph (B).
 - (2) **CONDITION FOR REPORT APPROVAL**- The Secretary shall not approve a project implementation report under this section until the agreement established under this subsection has been executed.
 - (3) **NO EFFECT ON LAW**- Nothing in the agreement established under this subsection shall alter or amend any existing Federal or State law, or the responsibility of any party to the agreement to comply with any Federal or State law.
- (j) **INDEPENDENT SCIENTIFIC REVIEW**-
- (1) **IN GENERAL**- The Secretary, the Secretary of the Interior, and the Governor, in consultation with the South Florida Ecosystem Restoration Task Force, shall establish an independent scientific review panel convened by a body, such as the National Academy of Sciences, to review the Plan's progress toward achieving the natural system restoration goals of the Plan.
 - (2) **REPORT**- The panel described in paragraph (1) shall produce a biennial report to Congress, the Secretary, the Secretary of the Interior, and the Governor that includes an assessment of ecological indicators and other measures of progress in restoring the ecology of the natural system, based on the Plan.
- (k) **OUTREACH AND ASSISTANCE**-
- (1) **SMALL BUSINESS CONCERNS OWNED AND OPERATED BY SOCIALLY AND ECONOMICALLY DISADVANTAGED INDIVIDUALS**- In executing the Plan, the Secretary shall ensure that small business concerns owned and controlled by socially and economically disadvantaged individuals are provided opportunities to participate under section 15(g) of the Small Business Act (15 U.S.C. 644(g)).
 - (2) **COMMUNITY OUTREACH AND EDUCATION**-
 - (A) **IN GENERAL**- The Secretary shall ensure that impacts on socially and economically disadvantaged individuals, including individuals with limited English proficiency, and communities are considered during implementation of the Plan, and that such individuals have opportunities to review and comment on its implementation.
 - (B) **PROVISION OF OPPORTUNITIES**- The Secretary shall ensure, to the maximum extent practicable, that public outreach and educational opportunities are provided, during implementation of the Plan, to the individuals of South Florida, including individuals with limited English proficiency, and in particular for socially and economically disadvantaged communities.
 - (l) **REPORT TO CONGRESS**- Beginning on October 1, 2005, and periodically thereafter until October 1, 2036, the Secretary and the Secretary of the Interior, in consultation with the Environmental Protection Agency, the Department of Commerce, and the State of Florida, shall jointly submit to Congress a report on the implementation of the Plan. Such reports shall be completed not less often than every 5 years. Such reports shall include a description of planning, design, and construction work completed, the amount of funds expended during the period covered by the report (including a detailed analysis of the funds expended for adaptive assessment under subsection (b)(2)(C)(xi)), and the work anticipated over the next 5-year period. In addition, each report shall include—
 - (1) the determination of each Secretary, and the Administrator of the Environmental Protection Agency, concerning the benefits to the natural sys-

tem and the human environment achieved as of the date of the report and whether the completed projects of the Plan are being operated in a manner that is consistent with the requirements of subsection (h);

(2) progress toward interim goals established in accordance with subsection

(h)(3)(B); and

(3) a review of the activities performed by the Secretary under subsection (k) as they relate to socially and economically disadvantaged individuals and individuals with limited English proficiency.

(m) **REPORT ON AQUIFER STORAGE AND RECOVERY PROJECT-** Not later than 180 days after the date of enactment of this Act, the Secretary shall transmit to Congress a report containing a determination as to whether the ongoing Biscayne Aquifer Storage and Recovery Program located in Miami-Dade County has a substantial benefit to the restoration, preservation, and protection of the South Florida ecosystem.

(n) **FULL DISCLOSURE OF PROPOSED FUNDING-**

(1) **FUNDING FROM ALL SOURCES-** The President, as part of the annual budget of the United States Government, shall display under the heading 'Everglades Restoration' all proposed funding for the Plan for all agency programs.

(2) **FUNDING FROM CORPS OF ENGINEERS**

CIVIL WORKS PROGRAM- The President, as part of the annual budget of the United States Government, shall display under the accounts 'Construction, General' and 'Operation and Maintenance, General' of the title 'Department of Defense—Civil, Department of the Army, Corps of Engineers—Civil', the total proposed funding level for each account for the Plan and the percentage such level represents of the overall levels in such accounts. The President shall also include an assessment of the impact such funding levels for the Plan would have on the budget year and long-term funding levels for the overall Corps of Engineers civil works program.

(o) **SURPLUS FEDERAL LANDS-** Section 390(f)(2)(A)(i) of the Federal Agriculture Improvement and Reform Act of 1996 (110 Stat. 1023) is amended by inserting after 'on or after the date of enactment of this Act' the following: 'and before the date of enactment of the Water Resources Development Act of 2000'.

(p) **SEVERABILITY-** If any provision or remedy provided by this section is found to be unconstitutional or unenforceable by any court of competent jurisdiction, any remaining provisions in this section shall remain valid and enforceable.

Appendix B: South Florida Ecosystem Restoration Task Force Charter

SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

Task Force Charter
August 1, 1997

1. AUTHORIZATION. The South Florida Ecosystem Restoration Task Force was established by section 528(f) of Public Law 104-303, the Water Resources Development Act of 1996 (hereinafter referred to as the Act), enacted October 12, 1996.

2. DUTIES. The Task Force was established to:

a. Consult with, and provide recommendations to, the Secretary of the Army and the non-Federal project sponsor in developing a comprehensive plan for the purpose of restoring, preserving, and protecting the South Florida ecosystem, in accordance with sections 528(b)(1) and 528(f)(2)(A) of the Act.

b. Coordinate the development of consistent policies, strategies, plans, programs, projects, activities, and priorities for addressing the restoration, preservation, and protection of the South Florida ecosystem, as provided in section 528(f)(2)(B) of the Act. Such coordination shall include cooperation with the Secretary of the Army and the non-Federal project sponsor in determining whether a critical restoration project for the South Florida ecosystem will produce independent, immediate, and substantial restoration, preservation, and protection benefits, and will be generally consistent with the "Conceptual Plan for the Central and Southern Florida Project Restudy" prepared by the Governor's Commission for a Sustainable South Florida, in accordance with section 528(b)(3)(A) of the Act.

c. Exchange information regarding programs, projects, and activities of the agencies and entities represented on the Task Force to promote ecosystem restoration and maintenance, as provided in section 528(f)(2)(C) of the Act.

d. Establish a Florida-based working group to formulate, recommend, coordinate, and implement the policies, strategies, plans, programs, projects, activities, and priorities of the Task Force, in accordance with section 528(f)(2)(D) of the Act.

e. Facilitate the resolution of interagency and inter-governmental conflicts associated with the restoration of the South Florida ecosystem among agencies and entities represented on the Task Force, as provided in section 528(f)(2)(F) of the Act.

f. Coordinate scientific and other research associated with the restoration of the South Florida ecosystem, as provided in section 528(f)(2)(G) of the Act.

g. Provide assistance and support to agencies and entities represented on the Task Force in their restoration activities, as provided in section 528(f)(2)(H) of the Act.

h. Prepare an integrated financial plan and recommendations for coordinated budget requests for the funds proposed to be expended by agencies and entities represented on the Task Force for the restoration, preservation, and protection of the South Florida ecosystem, as provided in section 528(f)(2)(I) of the Act.

i. Submit a biennial report to Congress that summarizes the activities of the Task Force; the policies, strategies, plans, programs, projects, activities, and priorities planned, developed, or implemented for the restoration of the South Florida ecosystem; and progress made toward the restoration, as provided in section 528(f)(2)(J) of the Act.

3. POWERS. The Task Force may -

a. Establish advisory bodies as it deems necessary to assist the Task Force in its duties, including advisory bodies on public policy and scientific issues, in accordance with section 528(f)(2)(E)(i) of the Act.

b. Select as an advisory body any entity, such as the Governor's Commission for a Sustainable South Florida, that represents a broad variety of public and private interests, as provided in section 528(f)(2)(E)(ii) of the Act.

c. Seek advice and input from any interested, knowledgeable, or affected party as it determines necessary to perform its duties, as provided in section 528(f)(3)(B).

4. MEMBERSHIP.

a. The Task Force consists of 14 members, as follows, pursuant to section 528(f)(1) of the Act:

(1) Seven Federal members, each of whom may be represented by a designee at the level of assistant secretary or the equivalent:

(i) The Secretary of the Interior, who shall serve as chairperson.

(ii) The Secretary of Commerce.

(iii) The Secretary of the Army.

(iv) The Attorney General.

(v) The Administrator of the Environmental Protection Agency.

(vi) The Secretary of Agriculture.

(vii) The Secretary of Transportation.

(2) One member from each the following Indian Tribes, each of whom shall be appointed by the Secretary of the Interior based on the recommendations of the respective tribal chairman:

(i) The Seminole Tribe of Florida.

(ii) The Miccosukee Tribe of Indians of Florida.

(3) Two representatives of the State of Florida appointed by the Secretary of the Interior based on the recommendations of the Governor.

(4) One representative of the South Florida Water Management District appointed by the Secretary of the Interior based on the recommendations of the Governor.

(5) Two representatives of local government in the State of Florida to be appointed by the Secretary of the Interior based on the recommendations of the Governor.

b. There is no time limit for the term of any member. A person's membership shall terminate after leaving the office from which that member was appointed or designated. Any of the federal officials listed in subparagraph 4.a.(1), above, may at any time designate a substitute member at the level of

assistant secretary or the equivalent. Any member appointed by the Secretary of the Interior based on the recommendation of the Governor may be removed or replaced by the Secretary of the Interior based on the recommendation of the Governor. Any member appointed by the Secretary of the Interior based on the recommendation of a tribal chairman may be removed or replaced by the Secretary of the Interior based on the recommendation of the chairman of the same Tribe.

c. Any vacancy on the Task Force shall be filled in the same manner in which the original appointment was made.

d. A member shall receive no additional compensation for service on the Task Force, in accordance with section 528(f)(4) of the Act.

5. ADMINISTRATION.

a. An Executive Director shall assist the Secretary of the Interior and the Task Force in carrying out their administrative and procedural duties, including the requirements in section 528(f)(3)(ii) of the Act. The Executive Director shall be appointed by the Secretary of the Interior, and shall be an employee of the United States Department of the Interior.

b. The Task Force will meet at the call of the Chairperson or of a majority of the members, but not less often than semi-annually.

c. A majority of the members then serving will constitute a quorum.

d. Travel expenses incurred by a member of the Task Force in the performance of services for the Task Force shall be paid by the agency, tribe, or government that the member represents, as provided in section 528(f)(5) of the Act.

e. The Task Force is not considered an advisory committee subject to the Federal Advisory Committee Act, and it may seek advice or input from interested, knowledgeable, or affected parties without being subject to the Federal Advisory Committee Act, pursuant to section 528(f)(3)(C) of the Water Resources Development Act of 1996.

f. The Task Force shall implement procedures to facilitate public participation in its functions. Those procedures shall include providing advance notice of meetings, providing adequate opportunity for public

input and comment, maintaining appropriate records, and making a record of the proceedings of meetings available for public inspection, as required by section 528(f)(3)(A)(i) of the Act.

g. The Task Force may adopt principles and operational guidelines to set forth the required procedures for public participation, and for any other purpose necessary or convenient for the accomplishment of the duties of the Task Force.

h. In the absence of procedures adopted by the Task Force, the Executive Director may establish protocols for accomplishment of the duties of the Task Force. The Executive Director will promptly notify all members of the protocols. Such protocols may be amended by the Task Force.

i. Nothing in this Charter shall be construed to prejudice the appointments of members already made pursuant to the Act, or the activities of the Task Force since October 12, 1996.

6. PERSONNEL.

a. The Executive Director shall provide staff support to the Task Force.

b. The Executive Director may be assisted by a permanent staff of the executive directorate; personnel on temporary assignment to the executive directorate from agencies, governments, or tribes represented on the Task Force or the Working Group; by members of the Task Force or Working Group or the staffs of such members; or by contractors. The Task Force may authorize the Executive Director to request, from the head of any Federal agency not represented on the Task Force, personnel to be detailed to assist the Executive Director or the Task Force.

7. TERMINATION. The Task Force shall continue to exist only for so long as it is authorized by Federal law.

Signed By:

Secretary of the Interior - Bruce Babbitt

Appendix C: FY 2000 US Dept. of Interior Report to Congress on Restoring the South Florida Ecosystem

South Florida Ecosystem - Total Cost Report (Revised 3/27/00)

	(\$ in millions)	
	Federal Costs	State Costs
Goal 1: Getting the water right		
Ongoing projects	1,197	1,044
Comprehensive Plan	3,900	3,900
Goal 2: Restore and enhance the natural system		
Land acquisition	584	3,405
Other	713	34
Goal 3: Transforming the built environment	59	to be determined
Total	6,453	8,383

I. Introduction

The Conference Committee Report language accompanying the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 2000, Public Law 106-113, requested that the Department submit information, to be updated biennially, on the total cost of the effort to restore the South Florida ecosystem. In relevant part, the report language states:

It would be useful to have a complete estimate of the total costs to restore the South Florida ecosystem. The House and Senate Committees on Appropriations believe that this new estimate will exceed the \$7,800,000,000 estimate that has been used over the last five years. This recalculated estimate should include all three goals of this initiative, namely, (1) getting the water right, (2) restoring and enhancing the natural habitat, and (3) transforming the built environment. The Congress and the American people are committed to this project. Over \$1,300,000,000 has been appropriated to date; however, and the public deserves to know how much this project will truly cost. This information should be submitted to the House and Senate Committees on Appropriations no later than February 1, 2000, and should be updated biennially.

The purpose of this report is to provide the House and Senate Appropriations Committees with the Department's best estimate for the total costs to restore the South Florida ecosystem. The estimate provided in Part V of this report reflects state and Federal costs to date for major on-going programs that advance the goals of the restoration effort, as well as future estimated costs to complete this work or associated with planned or proposed activities that are not yet underway. The estimate exceeds the \$7.8 billion figure representing the costs to construct project features associated with the implementation of the Army Corps of Engineers' Central and Southern Florida Project Comprehensive Everglades Restoration Plan presented to Congress on July 1, 1999. The Department believes that the actual costs to construct the Comprehensive Plan may be lower or higher depending upon a variety of factors, such as congressional authorization for project features that will undergo further site specific studies and analyses prior to initiating construction. The Department will update this report biennially to reflect any future changes.



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

MAR 30 2000



Honorable Ralph Regula
Chairman

Subcommittee on
Interior and Related Agencies
Committee on Appropriations
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

On March 8, 2000, the Department submitted a report to you on the total cost estimate to restore the South Florida ecosystem.

This provides a revised cost estimate report.

The total cost of \$14.8 billion has not changed, nor has the \$8.4 billion estimated to be the responsibility of the State of Florida. Total Federal costs have been revised from \$6.4 billion to \$6.5 billion (+\$25.0 million) to reflect revised estimates for the Department of the Interior land acquisition needs.

As a result of this revision, \$424.0 million is estimated as the balance to complete Department of the Interior funding, subject to the availability of appropriations. Through FY 2000, \$915.0 million has been appropriated for the Department of the Interior.

Again, the Department appreciates the significant support and funding that this Committee has provided for the South Florida Ecosystem Restoration Initiative.

Similar letters have been sent to the Honorable Norman Dicks, Ranking Minority Member; the Honorable Stade Gorton and the Honorable Robert C. Byrd, Chairman and Ranking Minority Member respectively, of the Subcommittee on the Department of the Interior and Related Agencies, Committee on Appropriations, United States Senate.

Sincerely,

John Berry
Assistant Secretary
Policy, Management and Budget

Enclosure

Although some of the activities included in the Department's total cost estimate began well before the emphasis in the last decade on ecosystem restoration (e.g. state land preservation efforts, the Modified Water Deliveries Project for Everglades National Park, the State of Florida's Everglades Construction Project), and may well have occurred without such increased emphasis, the Department is including the non-recurring costs for these activities as their completion is integral to the overall success of the restoration of the South Florida ecosystem. Not included in the Department's estimate, however, are the normal recurring operating costs - or "agency mission" costs - for state and federal agencies. For example, National Park Service costs to operate and maintain Everglades National Park, Fish and Wildlife Service costs to provide for Endangered Species Act consultation, and South Florida Water Management District costs to operate and maintain its water delivery infrastructure are not included. Although the Department has cited such figures in the past, as included in the Task Force's annual cross-cut budget, to describe its total funding in support of the South Florida ecosystem restoration effort, the Department believes that it is proper to exclude these agency mission costs and focus primarily on the increased funding devoted to this effort that occurred or is planned to occur due to specific restoration needs or goals.

To provide context for the total cost estimate, Part II of this report provides a brief background on the South Florida ecosystem; Part III summarizes major on-going state and Federal efforts key to the restoration that preceded the establishment of the South Florida Ecosystem Restoration Task Force (Task Force) and the 1992 Congressional authorization and direction for the Army Corps of Engineers to complete its Restudy for the Central and Southern Florida Project; Part IV briefly describes future efforts; and Part V provides the Department's best estimate to date for the total costs to restore the South Florida ecosystem. The programs and associated costs included in Part V are arranged according to the three goals for the restoration effort; Federal and state costs are noted accordingly. Federal costs are further subdivided according to individual agencies.

In accordance with the Committee's directive, this report will be updated biennially as more information becomes available and current plans and cost estimates are updated in response to lessons learned and new information. The Department believes that expanding knowledge of ecosystem restoration requirements in South Florida and the process of adaptive management for implementation of the Comprehensive Plan will result in changes to the total cost estimate presented in Part V.

II. Background - South Florida Ecosystem

In its natural state, the South Florida ecosystem was connected by the flow of water south from Lake Okeechobee through vast freshwater marshes - known as the Everglades - to Florida Bay and on to the coral reefs of the Florida Keys. The Everglades covered approximately 18,000 square miles and were the heart of a unique and biologically productive region, supporting vast colonies of wading birds, a mixture of temperate and tropical plant and animal species, and teeming coastal fisheries.

During the last century, efforts were made to drain the Everglades and make the region habitable. This culminated in the construction of the Central and Southern Florida Project, a flood control

project jointly built and managed by the Army Corps of Engineers and the South Florida Water Management District. In response to periods of drought and extreme floods, which left 90 percent of South Florida under water, this project was authorized by Congress in 1948 and succeeded in draining half of the original Everglades, allowing for the expanded development of cities on the lower east coast of Florida and the farming area south of Lake Okeechobee known as the Everglades Agricultural Area (EAA). Although historically most rainwater soaked into the region's wetlands, the Central and Southern Florida Project canal system, comprised of over 1,800 miles of canals and levees and 200 water control structures, now drains the water off the land such that an average of 1.7 billion gallons of water per day are discharged into the ocean. Additionally, phosphorus runoff from agricultural operations has polluted much of the remaining Everglades and Lake Okeechobee and caused fundamental, and negative, ecological change.

As a result, not enough clean water is available for the environment, resulting in long-term problems for the Everglades and the communities in the region. Examples include: (i) ninety percent reductions in wading bird populations; (ii) 68 species listed as endangered or threatened; (iii) reduced fisheries in Biscayne and Florida Bays; (iv) loss of over five feet of organic soil in the EAA; (v) degraded water quality in inland and coastal areas; (vi) infestation and spread of invasive exotic plant species on over 1.5 million acres; (vii) damaging fresh water releases into the St. Lucie, Caloosahatchee, and many other estuaries; (viii) loss of wetlands that provide important species habitat and ground water recharge; (ix) loss of tree islands and damaging ecological effects in the state managed water conservation areas. Without significant infrastructure modification, these problems have the potential only to get worse and water shortages are a certainty in future years as water demands continue to grow.

Today, South Florida is home to 6.5 million people and the population is expected to double by 2050. The region receives over 37 million tourists annually and supports a \$200 billion economy. Restoration is an imperative - not only for ensuring a sustainable South Florida economy to guarantee clean fresh water supplies for all future needs - but also to protect the ecological health of the Everglades that has been nationally and internationally recognized as like no other place on Earth.

III. Major On-Going State and Federal Efforts to Protect and Restore the South Florida Ecosystem

Over the last decade, and prior to the establishment of the South Florida Ecosystem Restoration Task Force in 1993, significant efforts have been made at both the Federal and state level to reverse the trend of environmental degradation in the Everglades. These efforts include: (i) improving water quality and reducing pollutants entering Lake Okeechobee and the Everglades from agricultural interests; (ii) restoring more natural hydro patterns in areas such as Everglades National Park and the Kissimmee River Basin; (iii) acquiring land for Federal and state conservation areas, regional water storage capacity, habitat and recreation; and (iv) management and protection of the coral reef through the trusteeship of the National Oceanic and Atmospheric Administration's (NOAA) Florida Keys National Marine Sanctuary. Although other activities are included in the total cost estimate, a brief summary of the most significant projects follows:

Improving water quality: In the late 1970s, the State of Florida and the South Florida Water Management District began investigating ways to improve ecosystem water quality, including the Lake Okeechobee Works of the District, farm Best Management Practices, and a cattle buy-out program. By 1988, design had begun on the 3,700-acre Everglades Nutrient Removal Project. In 1988, the federal government sued the State of Florida for its failure to enforce state water quality standards on pollution discharges from the EAA into the Everglades. This lawsuit was settled in 1991 and a judicially enforceable Consent decree ordered the state to take a series of remedial measures, including the construction of stormwater treatment areas (STAs) on former farms in the EAA to help clean up farm runoff. The technical plan in the original Consent decree was expanded significantly after mediation with stakeholders. In 1994, the Florida legislature enacted the Everglades Forever Act, which codified proposed modifications to the consent decree and provided for other measures to improve overall water quality, including funding mechanisms and construction timetable for a comprehensive program of six STAs, implementation of best management practices, additional research, establishing water quality criteria and implementation of advanced water quality treatment measures.

Among the most important of these measures is the completion of the Everglades Construction Project, a series of six STAs presently under construction and located between the EAA and the natural areas to the south. Of the six STAs, five are funded by the State of Florida and the sixth, STA 1-E, is federally funded to improve water quality discharges into Loxahatchee National Wildlife Refuge. The Everglades Construction Project is expected to cost approximately \$696 million in capital costs to complete, of which \$505 million is being financed by the State of Florida and \$190 million by the federal government (of which \$46 million was appropriated to the Department of the Interior in FY 1998 for land acquisition within STA 1-E). Construction of the STAs are proposed to be complete in December 2006. Although that date has yet to be approved by the court, which retains jurisdiction over this matter, the projects called for by the Consent decree are implemented by the South Florida Water Management District.

Additionally, as a result of the Everglades Forever Act, the South Florida Water Management District established the Everglades Stormwater Program, which includes two main components in the form of an EAA phosphorus reduction program and the Urban and Tributary Basins Program. The EAA phosphorus reduction program includes regulatory programs developed to reduce phosphorus loads from the EAA by reducing phosphorus on the surrounding farms and other adjacent land prior to discharging off-site. Landowners in the EAA have implemented a series of best management practices that have effectively reduced the phosphorus loads to the Everglades. Over the last three years, the total cumulative loads attributable to the EAA have been reduced by 44 percent. The Urban and Tributary Basins Program was developed to ensure that all basins discharging into, from or within the Everglades, other than those included in the EAA, meet state water quality standards. Costs associated with this program are not included in this report at this time as additional strategies, in the form of regulatory changes and construction, are still being developed.

Generally, the STAs and farm Best Management Practices are expected to reduce overall phosphorus levels to 50 parts per billion (ppb), thus improving water quality from EAA discharges and other sources compared to current levels. However, the Everglades Forever Act requires the state to adopt a numeric criterion for phosphorus by 2003 so that all discharges into

the Everglades will meet Federal and state water quality standards by 2006. If the state does not adopt a numeric criterion, the Everglades Forever Act sets a default standard of 10ppb. It appears that additional measures will likely be needed to further enhance the performance of the STAs to meet these requirements; however, the costs to make such modifications are not known at this time. The South Florida Water Management District is presently conducting research into advanced treatment technologies to enhance the performance of the STAs, and also to be potentially applied to other tributaries of the Everglades. Although funding for the implementation of advanced treatment has not been appropriated, to date \$10 million has been budgeted by the South Florida Water Management District towards that research. Once completed, these efforts are expected to significantly improve water quality for the region.

As part of the effort to improve water quality in Lake Okeechobee, the South Florida Water Management District is conducting the Lake Okeechobee Sediment Removal Feasibility Study. The purpose of the study is to identify a feasible method of removing sediment that will reduce the internal phosphorus loading and balance the lake's nutrient assimilative capacity. Costs to implement this program are not known at this time.

In addition to these measures, and in recognition of the critical role of water quality in maintaining coral reef natural resources, the Florida Keys National Marine Sanctuary and Protection Act of 1990 required the Secretary of Commerce, the Environmental Protection Agency, and the State of Florida to develop a Water Quality Protection Program for the Sanctuary.

Restoring more natural hydropatterns: More natural hydropatterns are presently being restored in Everglades National Park and the Kissimmee River Basin. In 1989, Congress enacted the Everglades National Park Protection and Expansion Act (Act) to expand Everglades National Park and to restore more natural sheet water flows to the park and Shark River Slough. To restore more natural sheet water flows to the park, the Act authorized the construction of the Modified Water Deliveries Project. That project is 100% federally funded by the Department of the Interior and is presently scheduled for completion in 2003, depending upon the availability of federal funding and completion of ongoing planning. The estimated total cost for this project is between \$133.5 million and \$212 million. The range of costs is based upon alternative design scenarios for certain project features that are presently undergoing supplemental National Environmental Policy Act (NEPA) compliance. The project is undergoing supplemental NEPA compliance because: (i) the original project authorization was amended in 1994; and (ii) completion of both the C-111 project design and the Comprehensive Everglades Restoration Plan expanded agency knowledge that raised questions concerning the original 1992 design for the 8.5 Square Mile Area flood mitigation component of the Modified Water Deliveries Project. This led to technical disagreements among the relevant agencies and stakeholders over the appropriate course of action and alternatives are being explored under the NEPA process. If a locally preferred option for the 8.5 Square Mile Area component of this project is chosen the project will be cost shared between the Federal government and the South Florida Water Management District. For the purposes of this report, a range of costs is presented for this project, although this does not indicate a decision by the Federal government or the South Florida Water Management District to proceed with any of the alternatives presently being evaluated under NEPA.

Authorized by Congress in 1992, the Kissimmee River Restoration project is intended to reverse the environmental devastation of earlier efforts to channel the once 103 mile free flowing river into a 56 mile canal, destroying nearly 43,000 acres of wetlands and important habitat. The project involves restoring about 40 square miles of the historic habitat in the Kissimmee river floodplain north of Lake Okeechobee, as well as restoring water-level fluctuations and seasonal discharges from Lakes Kissimmee and in the upper basin lakes. This project is estimated to cost approximately \$518 million, is equally cost shared with the South Florida Water Management District, and is expected to be complete in 2010.

The C-111 project comprises modifications to the Central and Southern Florida Project to provide more natural hydrologic conditions in Taylor Slough and the panhandle of Everglades National Park and to minimize damaging flood releases to Barnes Sound and Manatee Bay. Restoring natural hydrologic conditions in Taylor Slough is integral to restoring fresh water flows to Florida Bay. The project was initially authorized by Congress in 1991 at a cost of \$155 million, including land, and a completion date of 2001. Reauthorized by Congress in 1996, the Army Corps is directed to consider state water quality standards and incorporate the necessary features into the C-111 project implementation. The 1996 authorization states that all project costs, including land, are to be shared equally between the Army Corps and the South Florida Water Management District. A supplement to the 1994 C-111 General Reevaluation Report will include actual land acquisition costs, a water quality strategy, redistribution of funding responsibilities and a revised implementation timeline, all of which may result in a revised cost estimate.

In addition to improving water quality, certain components of the Everglades Construction Project described above will restore more natural hydro patterns in the northern Everglades presently severed by the Central and Southern Florida Project. The STA 1-E/C-51W Project will provide flood control for the western C-51 basin and will restore a portion of the historic Everglades flows to Loxahatchee National Wildlife Refuge. The current project was reauthorized by Congress in 1996; project construction is 15% cost shared with the South Florida Water Management District, with the District providing all lands, easements and rights-of-way, with the exception of those lands that are incorporated into STA 1-E, as discussed below, which is 100% federally funded and for which the Department of the Interior provided \$46 million, through a grant to the South Florida Water Management District, towards land acquisition costs. The Department has just learned that the costs to complete land acquisition for STA 1-E will be higher, but does not have a revised estimate at this time. It is estimated that the STA 1-E/C-51W project will cost \$210 million when complete in 2003, although this number will change once final land acquisition costs are known.

Land Acquisition: The Federal and state governments have expended significant funds to acquire and protect lands in the region. Land acquisition is a critical part of ecosystem restoration as acquired lands are needed to protect key federal and state conservation areas, create and restore additional water storage capacity and recharge areas to help increase overall water supplies and restore natural hydrology, and for habitat protection and enhancement and for recreation. As described above, some lands are also used to improve overall water quality (e.g. STAs).

Significant actions taken to protect South Florida's natural resources since the establishment of Everglades National Park in 1947 and its expansion in 1989 (together protecting 1.4 million acres of the remaining Everglades) include: (i) Florida's 1972 Land Conservation Act, 1981 Save Our Rivers Program, 1990 Preservation 2000 Act, and the Florida Forever Act that dedicate state funding for land acquisition at state parks and preserves in the ecosystem; (ii) the 1996 Federal Agriculture Improvement and Reform Act (Farm Bill) that provided the Department with \$200 million for ecosystem restoration, including land acquisition; and (iii) numerous annual Interior Appropriations Acts that have funded land acquisition at parks and refuges in the region, as well as additional state land acquisition assistance funds. The state assistance funds provided by the Department of the Interior have, for the most part, been targeted towards acquisition of lands that create additional opportunities for water storage and are generally expected to be incorporated into a Comprehensive Plan project feature.

Through these efforts, it is estimated that \$1.6 billion has been spent to date (of which \$1.1 billion is state funding and \$0.5 billion is federal) for the acquisition of 4.7 million acres. It is estimated that about 638,000 non-Federal acres remain to be acquired in South Florida at an estimated cost of \$2.2 billion. These figures do not include the 220,000 acres of lands needed for the Comprehensive Plan implementation, which are included in the overall cost estimate for the Comprehensive Plan.

Critical Restoration Projects: Pursuant to the Water Resources Development Act of 1996, the Army Corps and the South Florida Water Management District have entered into agreements to undertake nine critical restoration projects that will provide immediate and substantial benefits for the ecosystem. The Corps and the Seminole Tribe have entered into a similar agreement for one critical project. The ten projects have a total cost of \$150 million, half of which will be paid for by the Federal government. These projects, although small and including such features as improving flows under the Tamiami Trail, have immediate environmental benefits that will assist in achieving the goals of the restoration.

Exotic Species Control: Commensurate with land acquisition is proper land management and efforts to eradicate and prevent the spread of invasive exotic plant species. More than 200 species of exotic plant species have invaded the Everglades. The majority of these species occur in limited areas, and do not pose a direct threat to native plant communities. However, plants like melaleuca, Brazilian pepper, Australian pine, and Old World climbing fern, are causing widespread damage throughout the South Florida ecosystem, and are considered species of primary concern. The South Florida Water Management District, state, and federal government are all directing resources to combat this problem. While areal coverage for some species will decrease with vigilant management efforts – which has been the case with melaleuca – new species could invade without additional management initiatives. The history of this problem indicates that management efforts will only intensify with time and should be considered a perpetual management requirement in the Everglades region.

IV. Proposed Future Everglades Restoration Efforts

Despite the on-going efforts described above, it is widely recognized that full restoration of the South Florida would require an overhaul of the 1948 Central and Southern Florida Project. To this end, in the 1992 and 1996 Water Resources Development Acts, Congress directed the Army Corps of Engineers to conduct a comprehensive review study (now known as the Comprehensive Plan) of the entire project with a focus on making changes that would restore, preserve and protect the environment, while also providing clean and adequate fresh water supplies and flood protection to communities. Completion of the Comprehensive Plan was an interagency and intergovernmental effort consisting of an inclusive and open process with opportunity for input from all stakeholders.

The Comprehensive Plan was submitted to Congress on July 1, 1999. Comprised of over 60 structural and operational elements, the Comprehensive Plan proposes a conceptual framework to store water for critical uses; manage water to improve the quality, quantity, timing and distribution of flows to the Everglades; improve wildlife habitat; and create wetlands to filter runoff. The estimated non-recurring capital cost, including real estate acquisition and construction of project features, for the Comprehensive Plan is \$7.8 billion, of which 50% is proposed to be provided by the state, with the remainder provided by the Federal government. Operating costs, or those costs that recur on an annual basis, are estimated at \$172 million per year at full build out and are not included in the total cost estimate as they resemble agency mission costs that were excluded for other programs. The Administration shortly expects to submit its authorization proposal for an initial suite of projects to implement the Comprehensive Plan. It is expected that the Comprehensive Plan will take more than 20 years to complete, with the Army Corps of Engineers providing nearly all of the Federal funding. Its completion is integral to achieving two of the three goals of the restoration effort, discussed further below, and it is the single largest cost component of the restoration effort.

Also in 1996, in an effort to encourage appropriate Federal and state agencies to work more closely together, the Congress established the South Florida Ecosystem Restoration Task Force (Task Force), chaired by the Secretary of the Interior, with the mandate to guide the restoration of the South Florida ecosystem. To this end, the Task Force established three goals: (1) getting the water right: that is, to restore a more natural water flow to the region while providing adequate water supplies, water quality and flood control; (2) restore and enhance the natural system, protecting natural habitats and reestablishing threatened and endangered species; and (3) transform the built environment to develop lifestyles and economies that do not degrade the natural environment and improve the quality of life in urban areas.

The Task Force is presently developing a Strategic Plan, to be submitted to Congress by July 31, 2000, that will integrate on-going efforts with future proposed actions like the Comprehensive Plan. The Strategic Plan will outline how the overall restoration of the South Florida ecosystem will occur, identify the resources needed to accomplish restoration objectives, assign accountability for accomplishing actions, and link the goals established by the Task Force to outcome-oriented goals. At this time, and based upon input from State of Florida stakeholders, the state is reviewing Goal 3, "transforming the built environment," including state proposals for managing growth. Because implementation of Goal 3 is largely viewed as a state responsibility

and the State of Florida is considering how to address this issue, the Department is including only estimated Federal costs in support of the present goal. The Department expects that the completion of the Strategic Plan will result in an improved ability to report on costs to implement this goal.

V. Estimated Total Costs for the Restoration of the South Florida Ecosystem

This section presents the Department's best estimate for the total costs for South Florida ecosystem restoration. As noted earlier, these costs are comprised of: (1) major on-going programs; and (2) future planned activities that may change, based upon site specific designs and new information, or may require future Federal and/or state legislative authorization.

Finally, this report may not have captured all of the costs that could be categorized by some as meeting the goals of Everglades restoration. A sustainable environment will also need a diverse and balanced economy. The regional economy should continue to support traditional industries such as agriculture, tourism, development, fishing and manufacturing. It must ensure that these resource-dependent industries are compatible with restoration goals and will maintain or enhance the quality of life in built areas. It is difficult to quantify the costs of responsible development that would include such characteristics as redeveloping declining urban areas, roads, utilities, services, and light rail, to name a few.

Managing growth and development problems cannot be solved by each local government acting alone. Roads do not stop at city and county boundaries. Our major natural resources and ecosystems frequently encompass parts of many local jurisdictions. A decision by one local government to construct a major public facility or permit private development can have a significant impact on an entire region, and the collective decisions of all local governments affect the entire state.

Among its recommendations to Congress in July 1999, the Comprehensive Plan recommended a feasibility study to identify the dominant water and environmental resource issues in southwest Florida in view of robust population growth in the region and to develop potential solutions to any problems that may be identified. The Southwest Florida Study is being conducted by the Army Corps and the South Florida Water Management District. The study area includes all of Lee County, most of Collier and Hendry Counties, and portions of Charlotte, Glades and Monroe Counties. It encompasses approximately 4,300 square miles and includes two major drainage basins. It is likely that this feasibility study could recommend programs and costs that would support any of the goals of the restoration effort. At this time, however, no costs are included as they are not yet known.

In accordance with the Committee's direction, the Department expects to provide updates of this information on at least a biennial basis, or more frequently should it be desired, so that all parties involved are aware of the significant Federal, state and local investments that are being made in this important effort. Following are estimated total costs, arranged according to the ecosystem restoration goals:

Goal 1: Getting the water right to restore a more natural water flow to the region while providing adequate water supplies, water quality and flood control (\$ in millions)

Ongoing Project/Agency	Total Cost	\$ Thru FY00	\$ Balance to Complete
Modified Water Deliveries for Evg. Nat'l Park /see note 1			
National Park Service Kissimmee River Restoration	135-212	63	72-150
Army Corps of Engineers SFWMD	225 293	64 183	161 110
C-111 /see note 2			
Army Corps of Engineers SFWMD	85 96	40 96	45 to be determined
C-51/STA-1E /see note 3			
Army Corps of Engineers SFWMD	205 [46] 35	107 [46] 35	98 to be determined 0
Army Corps Critical Restoration Projects			
Army Corps of Engineers SFWMD	75 75	14 14	61 61
Everglades Construction Project /see note 4			
SFWMD	506	246	260
Ecosystem Restoration Monitoring /see note 5			
NOAA/NOS	83	4	79

Federal Assistance for ecosystem land acquisition: /see note 6	193	193	N/A
DOI (1996 Farm Bill)	4	4	N/A
DOI (P.L. 103-219)	5	5	N/A
DOI (FY 94 Supp.)	5	5	N/A
DOI (FY 95)	[46]	[46]	N/A
DOI (FY 98)	60	60	N/A
DOI (FY 99)	45	45	N/A
DOI (FY 00)			N/A
Lake Okeechobee Rest. Plan /see note 7			
SFWMD	39	0	39
Future Projects:			
Comprehensive Everglades Restoration Plan	[7,800]		
Federal	3,900	0	3,900
Non-federal	3,900	0	3,900
Subtotal Goal 1	10,041	1,178	8,864

Notes on Goal 1:

- Range of costs for the Modified Water Deliveries Project represents uncertainties associated with the on-going NEPA process for project components, including the 8.5 Square Mile Area, and does not represent a final agency decision to select any alternative that is presently being studied.
- C-111 is undergoing a GRR supplement. The original project estimate was \$155; however, this will increase based upon the final alternative selected. The Water Resources Development Act of 1996 provides for a 50 percent cost share.
- STA1-E/C-51W is reported separately, as it is a Federal responsibility. Further, an additional amount is required to complete land acquisition. That cost estimate is being developed.
- Costs for STA1-E, which is a Federal part of the Everglades Construction Project, are shown separately.
- Assumes 20 year restoration effort beginning in 2002.
- FY 1998 funds for state assistance are included within estimate for C-51/STA 1-E project as the \$46 million appropriated was used to fund land acquisition costs for STA 1-E; the number is shown here as a non-add. Future DOI Federal funding assistance for state assistance, including the FY 01 budget request for \$47 million, is included within the future estimate for the Comprehensive Plan or State of Florida SOR/CARL land acquisitions, as lands that would be acquired would likely target implementation of these programs.
- Does not include funds for sediment removal for Lake Okeechobee; cost estimate not yet developed.

Goal 2: Restore and enhance the natural system protecting natural habitats and reestablishing threatened and endangered species

(\$ in millions)			
Ongoing Project/Agency	Total Cost	\$ Thru FY00	\$ Balance to Complete
Federal land acquisition for parks and refuges: /see note 1			
NPS:			
East Everglades Addition	104	104	0
Big Cypress Addition	43	43	0
Big Cypress Preserve	195	185	10
FWS:			
Archie Carr NWR	105	11	94
J.N. Ding Darling NWR	29	9	20
Pelican Island NWR	30	9	21
Lake Wales Ridge NWR	8	4	4
Florida Panther NWR	12	12	0
Florida Keys NWR	43	33	10
Crocodile Lake NWR	15	14	1
State land acquisition efforts /see note 2			
DEP/SFWMD	3,405	1,155	2,250
Exotic Species			
NPS, Hole in the Donut	75	12	63
DOI 1996 Farm Bill, Melaleuca Quarantine Facility	6	6	0
SFWMD /see note 3	4	4	0
Multi-species Recovery Plan			
FWS	26	8	18
Manatee Pass Gates			
Army Corps of Engineers	12	3	9
Biscayne Bay Study			
Army Corps of Engineers	6	2	4

Florida Keys Water Quality					398
EPA:		410		.12	
Comprehensive Water Quality Protection Plan					2
EPA		3		1	
Research, including Cooperative Ecosystem Restoration Studies Initiative /see note 4					
NPS (CESI)		39		39	to be determined
NOAA/NMFS		86		10	76
NOAA/NOS		50		11	39
SFWMD		30		8	22
Subtotal, Goal 2		4,736		1,695	3,041

- Notes on Goal 2:
- For FY 01, \$0.2 million is requested to complete Florida Panther, NWR. The number does not show due to rounding.
 - These lands were acquired using state dedicated funding sources such as Save Our Rivers, Preservation 2000 and the Florida Forever Act, but do not include acreage or costs associated with donation of lands for Everglades National Park and Biscayne National Park.
 - Includes advanced treatment technologies research, research and research monitoring, and modeling for Florida Bay and adjacent waters and wetlands.
 - CESI research needs are being determined as part of the Strategic Plan; NOAA costs assume 20 year restoration effort.

Goal 3: Transform the built environment to develop lifestyles and economies that do not degrade the natural environment and improve the quality of life in urban areas

Note: As described in the text, this goal is being revised due to input from State stakeholders and no state cost data is available. However, Federal costs supporting the concept of this goal are shown below.

Ongoing Projects	Total Cost	(\$ in millions)	Balance to Complete
Brownfield Redevelopment Grants			
EPA	13		10
Waste Water Treatment Facilities			
NPS, Everglades NP	38		33
Future Projects:			
Southwest Florida Programmatic EIS re: Clean Water Act Section 404 permits (see note 1)			
Army Corps of Engineers Southwest Florida Feasibility Study	to be determined		to be determined
Army Corps of Engineers SFWMD	4		1
	4		1
Subtotal, Goal 3	59		14
			45

Notes on Goal 3:

- This EIS is ongoing; costs to implement future recommended actions are not included at this time.



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240



MAR - 8 2000

Honorable Ralph Regula
Chairman
Subcommittee on the Department of the Interior and Related Agencies
Committee on Appropriations
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

The Conference Committee Report language accompanying the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 2000, Public Law 106-113, requested that the Department submit information, to be updated biennially, on the total cost of the effort to restore the South Florida ecosystem. In relevant part, the report language states:

It would be useful to have a complete estimate of the total costs to restore the South Florida ecosystem. The House and Senate Committees on Appropriations believe that this new estimate will exceed the \$7,800,000,000 estimate that has been used over the last five years. This recalculated estimate should include all three goals of this initiative, namely, (1) getting the water right, (2) restoring and enhancing the natural habitat, and (3) transforming the built environment. The Congress and the American people are committed to this project. Over \$1,300,000,000 has been appropriated to date; however, and the public deserves to know how much this project will truly cost. This information should be submitted to the House and Senate Committees on Appropriations no later than February 1, 2000, and should be updated biennially.

The \$7.8 billion figure cited in the report language represents the estimated costs to construct project features associated with the implementation - over the next twenty years or so - of the Army Corps of Engineers' Central and Southern Florida Project Review Study (Restudy). The Restudy, now known as the Comprehensive Everglades Restoration Plan, or Comprehensive Plan, was submitted to the Congress on July 1, 1999 and is integral to achieving two of the three goals of the restoration: (1) "getting the water right" to restore more natural water flows to the ecosystem, while guaranteeing regional water supplies and flood control; and (2) restoring and enhancing the natural system. Because congressional authorization is required for the Comprehensive Plan's proposed project features, and individual project features must undergo additional site specific studies and analyses, the Department believes that the overall cost to implement this significant and important component of the restoration effort could be lower or higher depending upon future analyses and site specific studies. Nothing in this report changes

(\$ in millions)

	Federal Costs	State Costs
Goal 1: Getting the water right		
Ongoing projects	1,197	1,044
Comprehensive Plan	3,900	3,900
Goal 2: Restore and enhance the natural system		
Land acquisition	559	3,405
Other	713	34
Goal 3: Transforming the built environment		
	59	to be determined
Total	6,428	8,383

the present estimate of \$7.8 billion to complete the Comprehensive Plan, for which the State of Florida will provide half, or \$3.9 billion, of the cost.

To develop the total cost estimate, the Department included the cost of the Comprehensive Plan, as well as certain on-going programs that pre-date the emphasis on ecosystem restoration that developed since the establishment of the South Florida Ecosystem Restoration Task Force in 1993. This includes several projects authorized prior to and independent of the Comprehensive Plan. For example, the Congress and the State of Florida have enacted legislation requiring the appropriate agencies to take certain steps towards restoration. The Department has included the costs for these measures because they actively promote overall restoration goals and establish baseline conditions for the Comprehensive Plan. An example of this type of cost is the Everglades Construction Project, authorized by the State of Florida's 1994 Everglades Forever Act and undertaken by the South Florida Water Management District as a direct result of a judicially enforceable consent decree settling water quality litigation brought by the United States against the South Florida Water Management District in 1988. The Everglades Construction Project is designed to significantly improve overall regional water quality through the construction of stormwater treatment areas.

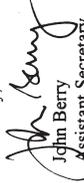
The Department has excluded certain "agency mission" costs, which are generally recurring in nature, including the operation and maintenance costs for the Central and Southern Florida Project, and operational costs for national parks and national wildlife refuges because the Department believes that these costs would occur without any additional emphasis on ecosystem restoration.

In response to the Committee's request, the Department submits the enclosed report with its best estimate for the total costs to restore the South Florida ecosystem. As noted in the report, the Department's total cost estimate is \$14.8 billion, of which \$8.4 billion are solely the responsibility of the State of Florida and \$6.4 billion are Federal costs. This total cost estimate represents state and Federal costs to date for major on-going programs that advance the goals of the restoration effort, as well as future estimated costs associated with planned or proposed activities that require congressional authorization or are in the preliminary planning stages. Of the federal costs included in this report, \$1.3 billion is estimated to be Department of the Interior funding supporting Goals 1 and 2; of which \$907 million represents funding through FY 2000, and \$405 million is estimated as the balance to complete, subject to the availability of future appropriations. A tabular display, by goal, of this cost estimate follows on the next page:

As noted in Part V of this report, the Department has limited information concerning state programs affecting Goal 3, "transforming the built environment." The state programs affecting Goal 3 are under review at this time in response to recent state proposals to manage growth and may be slightly revised, thus the Department is including information on Federal programs that it believes support this goal. Updated information concerning Goal 3 will be included in the Strategic Plan due this July, and a revised cost estimate for Goal 3 will be provided at that time.

The Department appreciates the significant support and funding that this Committee has provided for the South Florida Ecosystem Restoration Initiative. The Department notes that the State of Florida has recently committed to fund its share of the Comprehensive Plan and the Department looks forward to working with the Committee to secure the necessary funding and legislative authorization that will be required to continue our important work in this effort, protect the Federal investments made to date in national parks and national wildlife refuges, and most importantly, save America's Everglades. The Department would be pleased to discuss this report and its contents with you further. Similar letters have been sent to the Honorable Norman Dicks, Ranking Minority Member, the Honorable Slade Gorton and the Honorable Robert C. Byrd, Chairman and Ranking Minority Member respectively, of the Subcommittee on the Department of the Interior and Related Agencies, Committee on Appropriations, United States Senate.

Sincerely,



John Berry
Assistant Secretary

Policy, Management and Budget

Enclosure

I. Introduction

The Conference Committee Report language accompanying the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 2000, Public Law 106-113, requested that the Department submit information, to be updated biennially, on the total cost of the effort to restore the South Florida ecosystem. In relevant part, the report language states:

It would be useful to have a complete estimate of the total costs to restore the South Florida ecosystem. The House and Senate Committees on Appropriations believe that this new estimate will exceed the \$7,800,000,000 estimate that has been used over the last five years. This recalculated estimate should include all three goals of this initiative, namely, (1) getting the water right, (2) restoring and enhancing the natural habitat, and (3) transforming the built environment. The Congress and the American people are committed to this project. Over \$1,300,000,000 has been appropriated to date; however, and the public deserves to know how much this project will truly cost. This information should be submitted to the House and Senate Committees on Appropriations no later than February 1, 2000, and should be updated biennially.

The purpose of this report is to provide the House and Senate Appropriations Committees with the Department's best estimate for the total costs to restore the South Florida ecosystem. The estimate provided in Part V of this report reflects state and Federal costs to date for major on-going programs that advance the goals of the restoration effort, as well as future estimated costs to complete this work or associated with planned or proposed activities that are not yet underway. The estimate exceeds the \$7.8 billion figure representing the costs to construct project features associated with the implementation of the Army Corps of Engineers' Central and Southern Florida Project Comprehensive Everglades Restoration Plan presented to Congress on July 1, 1999. The Department believes that the actual costs to construct the Comprehensive Plan may be lower or higher depending upon a variety of factors, such as congressional authorization for project features that will undergo further site specific studies and analyses prior to initiating construction. The Department will update this report biennially to reflect any future changes.

Although some of the activities included in the Department's total cost estimate began well before the emphasis in the last decade on ecosystem restoration (e.g. state land preservation efforts, the Modified Water Deliveries Project for Everglades National Park, the State of Florida's Everglades Construction Project), and may well have occurred without such increased emphasis, the Department is including the non-recurring costs for these activities as their completion is integral to the overall success of the restoration of the South Florida ecosystem. Not included in the Department's estimate, however, are the normal recurring operating costs - or "agency mission" costs - for state and federal agencies. For example, National Park Service costs to operate and maintain Everglades National Park, Fish and Wildlife Service costs to provide for Endangered Species Act consultation, and South Florida Water Management District costs to operate and maintain its water delivery infrastructure are not included. Although the Department has cited such figures in the past, as included in the Task Force's annual cross-cut budget, to describe its

total funding in support of the South Florida ecosystem restoration effort, the Department believes that it is proper to exclude these agency mission costs and focus primarily on the increased funding devoted to this effort that occurred or is planned to occur due to specific restoration needs or goals.

To provide context for the total cost estimate, Part II of this report provides a brief background on the South Florida ecosystem; Part III summarizes major on-going state and Federal efforts key to the restoration that preceded the establishment of the South Florida Ecosystem Restoration Task Force (Task Force) and the 1992 Congressional authorization and direction for the Army Corps of Engineers to complete its Restudy for the Central and Southern Florida Project; Part IV briefly describes future efforts; and Part V provides the Department's best estimate to date for the total costs to restore the South Florida ecosystem. The programs and associated costs included in Part V are arranged according to the three goals for the restoration effort: Federal and state costs are noted accordingly. Federal costs are further subdivided according to individual agencies.

In accordance with the Committee's directive, this report will be updated biennially as more information becomes available and current plans and cost estimates are updated in response to lessons learned and new information. The Department believes that expanding knowledge of ecosystem restoration requirements in South Florida and the process of adaptive management for implementation of the Comprehensive Plan will result in changes to the total cost estimate presented in Part V.

II. Background - South Florida Ecosystem

In its natural state, the South Florida ecosystem was connected by the flow of water south from Lake Okeechobee through vast freshwater marshes - known as the Everglades - to Florida Bay and on to the coral reefs of the Florida Keys. The Everglades covered approximately 18,000 square miles and were the heart of a unique and biologically productive region, supporting vast colonies of wading birds, a mixture of temperate and tropical plant and animal species, and teeming coastal fisheries.

During the last century, efforts were made to drain the Everglades and make the region habitable. This culminated in the construction of the Central and Southern Florida Project, a flood control project jointly built and managed by the Army Corps of Engineers and the South Florida Water Management District. In response to periods of drought and extreme floods, which left 90 percent of South Florida under water, this project was authorized by Congress in 1948 and succeeded in draining half of the original Everglades, allowing for the expanded development of cities on the lower east coast of Florida and the farming area south of Lake Okeechobee known as the Everglades Agricultural Area (EAA). Although historically most rainwater soaked into the region's wetlands, the Central and Southern Florida Project canal system, comprised of over 1,800 miles of canals and levees and 200 water control structures, now drains the water off the land such that an average of 1.7 billion gallons of water per day are discharged into the ocean.

Additionally, phosphorus runoff from agricultural operations has polluted much of the remaining Everglades and Lake Okeechobee and caused fundamental, and negative, ecological change.

As a result, not enough clean water is available for the environment, resulting in long-term problems for the Everglades and the communities in the region. Examples include: (i) ninety percent reductions in wading bird populations; (ii) 68 species listed as endangered or threatened; (iii) reduced fisheries in Biscayne and Florida Bays; (iv) loss of over five feet of organic soil in the EAA; (v) degraded water quality in inland and coastal areas; (vi) infestation and spread of invasive exotic plant species on over 1.5 million acres; (vii) damaging fresh water releases into the St. Lucie, Caloosahatchee, and many other estuaries; (viii) loss of wetlands that provide important species habitat and ground water recharge; (ix) loss of tree islands and damaging ecological effects in the state managed water conservation areas. Without significant infrastructure modification, these problems have the potential only to get worse and water shortages are a certainty in future years as water demands continue to grow.

Today, South Florida is home to 6.5 million people and the population is expected to double by 2050. The region receives over 37 million tourists annually and supports a \$200 billion economy. Restoration is an imperative - not only for ensuring a sustainable South Florida economy to guarantee clean fresh water supplies for all future needs - but also to protect the ecological health of the Everglades that has been nationally and internationally recognized as like no other place on Earth.

III. Major On-Going State and Federal Efforts to Protect and Restore the South Florida Ecosystem

Over the last decade, and prior to the establishment of the South Florida Ecosystem Restoration Task Force in 1993, significant efforts have been made at both the Federal and state level to reverse the trend of environmental degradation in the Everglades. These efforts include: (i) improving water quality and reducing pollutants entering Lake Okeechobee and the Everglades from agricultural interests; (ii) restoring more natural hydro patterns in areas such as Everglades National Park and the Kissimmee River Basin; (iii) acquiring land for Federal and state conservation areas, regional water storage capacity, habitat and recreation; and (iv) management and protection of the coral reef through the trusteeship of the National Oceanic and Atmospheric Administration's (NOAA) Florida Keys National Marine Sanctuary. Although other activities are included in the total cost estimate, a brief summary of the most significant projects follows:

Improving water quality. In the late 1970s, the State of Florida and the South Florida Water Management District began investigating ways to improve ecosystem water quality, including the Lake Okeechobee Works of the District, farm Best Management Practices, and a cattle buy-out program. By 1988, design had begun on the 3,700-acre Everglades Nutrient Removal Project. In 1988, the federal government sued the State of Florida for its failure to enforce state water quality standards on pollution discharges from the EAA into the Everglades. This lawsuit was settled in 1991 and a judicially enforceable Consent decree ordered the state to take a series of remedial

measures, including the construction of stormwater treatment areas (STAs) on former farms in the EAA to help clean up farm runoff. The technical plan in the original Consent decree was expanded significantly after mediation with stakeholders. In 1994, the Florida legislature enacted the Everglades Forever Act, which codified proposed modifications to the consent decree as required for other measures to improve overall water quality, including funding mechanisms and construction timetable for a comprehensive program of six STAs, implementation of best management practices, additional research, establishing water quality criteria and implementation of advanced water quality treatment measures.

Among the most important of these measures is the completion of the Everglades Construction Project, a series of six STAs presently under construction and located between the EAA and the natural areas to the south. Of the six STAs, five are funded by the State of Florida and the sixth, STA 1-E, is federally funded to improve water quality discharges into Loxahatchee National Wildlife Refuge. The Everglades Construction Project is expected to cost approximately \$696 million in capital costs to complete, of which \$505 million is being financed by the State of Florida and \$190 million by the federal government (of which \$46 million was appropriated to the Department of the Interior in FY 1998 for land acquisition within STA 1-E). Construction of the STAs are proposed to be complete in December 2006. Although that date has yet to be approved by the court, which retains jurisdiction over this matter, the projects called for by the Consent decree are implemented by the South Florida Water Management District.

Additionally, as a result of the Everglades Forever Act, the South Florida Water Management District established the Everglades Stormwater Program, which includes two main components in the form of an EAA phosphorus reduction program and the Urban and Tributary Basins Program. The EAA phosphorus reduction program includes regulatory programs developed to reduce phosphorus loads from the EAA by reducing phosphorus on the surrounding farms and other adjacent land prior to discharging off-site. Landowners in the EAA have implemented a series of best management practices that have effectively reduced the phosphorus loads to the Everglades. Over the last three years, the total cumulative loads attributable to the EAA have been reduced by 44 percent. The Urban and Tributary Basins Program was developed to ensure that all basins discharging into, from or within the Everglades, other than those included in the EAA, meet state water quality standards. Costs associated with this program are not included in this report at this time as additional strategies, in the form of regulatory changes and construction, are still being developed.

Generally, the STAs and farm Best Management Practices are expected to reduce overall phosphorus levels to 50 parts per billion (ppb), thus improving water quality from EAA discharges and other sources compared to current levels. However, the Everglades Forever Act requires the state to adopt a numeric criterion for phosphorus by 2003 so that all discharges into the Everglades will meet Federal and state water quality standards by 2006. If the state does not adopt a numeric criterion, the Everglades Forever Act sets a default standard of 10ppb. It appears that additional measures will likely be needed to further enhance the performance of the STAs to meet these requirements; however, the costs to make such modifications are not known

at this time. The South Florida Water Management District is presently conducting research into advanced treatment technologies to enhance the performance of the STAs, and also to be potentially applied to other tributaries of the Everglades. Although funding for the implementation of advanced treatment has not been appropriated, to date \$10 million has been budgeted by the South Florida Water Management District towards that research. Once completed, these efforts are expected to significantly improve water quality for the region.

As part of the effort to improve water quality in Lake Okeechobee, the South Florida Water Management District is conducting the Lake Okeechobee Sediment Removal Feasibility Study. The purpose of the study is to identify a feasible method of removing sediment that will reduce the internal phosphorus loading and balance the lake's nutrient assimilative capacity. Costs to implement this program are not known at this time.

In addition to these measures, and in recognition of the critical role of water quality in maintaining coral reef natural resources, the Florida Keys National Marine Sanctuary and Protection Act of 1990 required the Secretary of Commerce, the Environmental Protection Agency, and the State of Florida to develop a Water Quality Protection Program for the Sanctuary.

Restoring more natural hydropatterns: More natural hydropatterns are presently being restored in Everglades National Park and the Kissimmee River Basin. In 1989, Congress enacted the Everglades National Park Protection and Expansion Act (Act) to expand Everglades National Park and to restore more natural sheet water flows to the park and Shark River Slough. To restore more natural sheet water flows to the park, the Act authorized the construction of the Modified Water Deliveries Project. That project is 100% federally funded by the Department of the Interior and is presently scheduled for completion in 2003, depending upon the availability of federal funding and completion of ongoing planning. The estimated total cost for this project is between \$133.5 million and \$212 million. The range of costs is based upon alternative design scenarios for certain project features that are presently undergoing supplemental National Environmental Policy Act (NEPA) compliance. The project is undergoing supplemental NEPA compliance because: (i) the original project authorization was amended in 1994; and (ii) completion of both the C-111 project design and the Comprehensive Everglades Restoration Plan expanded agency knowledge that raised questions concerning the original 1992 design for the 8.5 Square Mile Area flood mitigation component of the Modified Water Deliveries Project. This led to technical disagreements among the relevant agencies and stakeholders over the appropriate course of action and alternatives are being explored under the NEPA process. If a locally preferred option for the 8.5 Square Mile Area component of this project is chosen the project will be cost shared between the Federal government and the South Florida Water Management District. For the purposes of this report, a range of costs is presented for this project, although this does not indicate a decision by the Federal government or the South Florida Water Management District to proceed with any of the alternatives presently being evaluated under NEPA.

Authorized by Congress in 1992, the Kissimmee River Restoration project is intended to reverse

the environmental devastation of earlier efforts to channel the once 103 mile free flowing river into a 36 mile canal, destroying nearly 43,000 acres of wetlands and important habitat. The project involves restoring about 40 square miles of the historic habitat in the Kissimmee river floodplain north of Lake Okeechobee, as well as restoring water-level fluctuations and seasonal discharges from Lakes Kissimmee and in the upper basin lakes. This project is estimated to cost approximately \$518 million, is equally cost shared with the South Florida Water Management District, and is expected to be complete in 2010.

The C-111 project comprises modifications to the Central and Southern Florida Project to provide more natural hydrologic conditions in Taylor Slough and the panhandle of Everglades National Park and to minimize damaging flood releases to Barnes Sound and Manatee Bay. Restoring natural hydrologic conditions in Taylor Slough is integral to restoring fresh water flows to Florida Bay. The project was initially authorized by Congress in 1991 at a cost of \$155 million, including land, and a completion date of 2001. Reauthorized by Congress in 1996, the Army Corps is directed to consider state water quality standards and incorporate the necessary features into the C-111 project implementation. The 1996 authorization states that all project costs, including land, are to be shared equally between the Army Corps and the South Florida Water Management District. A supplement to the 1994 C-111 General Reevaluation Report will include actual land acquisition costs, a water quality strategy, redistribution of funding responsibilities and a revised implementation timeline, all of which may result in a revised cost estimate.

In addition to improving water quality, certain components of the Everglades Construction Project described above will restore more natural hydropatterns in the northern Everglades presently severed by the Central and Southern Florida Project. The STA 1-E/C-51W Project will provide flood control for the western C-51 basin and will restore a portion of the historic Everglades flows to Loxahatchee National Wildlife Refuge. The current project was reauthorized by Congress in 1996, project construction is 15% cost shared with the South Florida Water Management District, with the District providing all lands, easements and rights-of-way, with the exception of those lands that are incorporated into STA 1-E, as discussed below, which is 100% federally funded and for which the Department of the Interior provided \$46 million, through a grant to the South Florida Water Management District, towards land acquisition costs. The Department has just learned that the costs to complete land acquisition for STA 1-E will be higher, but does not have a revised estimate at this time. It is estimated that the STA 1-E/C-51W project will cost \$210 million when complete in 2003, although this number will change once final land acquisition costs are known.

Land Acquisition: The Federal and state governments have expended significant funds to acquire and protect lands in the region. Land acquisition is a critical part of ecosystem restoration as acquired lands are needed to protect key federal and state conservation areas, create and restore additional water storage capacity and recharge areas to help increase overall water supplies and restore natural hydrology, and for habitat protection and enhancement and for recreation. As described above, some lands are also used to improve overall water quality (e.g. STAs).

IV. Proposed Future Everglades Restoration Efforts

Despite the on-going efforts described above, it is widely recognized that full restoration of the South Florida would require an overhaul of the 1948 Central and Southern Florida Project. To this end, in the 1992 and 1996 Water Resources Development Acts, Congress directed the Army Corps of Engineers to conduct a comprehensive review study (now known as the Comprehensive Plan) of the entire project with a focus on making changes that would restore, preserve and protect the environment, while also providing clean and adequate fresh water supplies and flood protection to communities. Completion of the Comprehensive Plan was an interagency and intergovernmental effort consisting of an inclusive and open process with opportunity for input from all stakeholders.

The Comprehensive Plan was submitted to Congress on July 1, 1999. Comprised of over 60 structural and operational elements, the Comprehensive Plan proposes a conceptual framework to store water for critical uses; manage water to improve the quality, quantity, timing and distribution of flows to the Everglades; improve wildlife habitat; and create wetlands to filter runoff. The estimated non-recurring capital cost, including real estate acquisition and construction of project features, for the Comprehensive Plan is \$7.8 billion, of which 50% is proposed to be provided by the state, with the remainder provided by the Federal government. Operating costs, or those costs that recur on an annual basis, are estimated at \$172 million per year at full build out and are not included in the total cost estimate as they resemble agency mission costs that were excluded for other programs. The Administration shortly expects to submit its authorization proposal for an initial suite of projects to implement the Comprehensive Plan. It is expected that the Comprehensive Plan will take more than 20 years to complete, with the Army Corps of Engineers providing nearly all of the Federal funding. Its completion is integral to achieving two of the three goals of the restoration effort, discussed further below, and it is the single largest cost component of the restoration effort.

Also in 1996, in an effort to encourage appropriate Federal and state agencies to work more closely together, the Congress established the South Florida Ecosystem Restoration Task Force (Task Force), chaired by the Secretary of the Interior, with the mandate to guide the restoration of the South Florida ecosystem. To this end, the Task Force established three goals: (1) getting the water right; that is, to restore a more natural water flow to the region while providing adequate water supplies, water quality and flood control; (2) restore and enhance the natural system, protecting natural habitats and reestablishing threatened and endangered species; and (3) transform the built environment to develop lifestyles and economies that do not degrade the natural environment and improve the quality of life in urban areas.

The Task Force is presently developing a Strategic Plan, to be submitted to Congress by July 31, 2000, that will integrate on-going efforts with future proposed actions like the Comprehensive Plan. The Strategic Plan will outline how the overall restoration of the South Florida ecosystem will occur, identify the resources needed to accomplish restoration objectives, assign accountability for accomplishing actions, and link the goals established by the Task Force to

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Significant actions taken to protect South Florida's natural resources since the establishment of Everglades National Park in 1947 and its expansion in 1989 (together protecting 1.4 million acres of the remaining Everglades) include: (i) Florida's 1972 Land Conservation Act, 1981 Save Our Rivers Program, 1990 Preservation 2000 Act, and the Florida Forever Act that dedicate state funding for land acquisition at state parks and preserves in the ecosystem; (ii) the 1996 Federal Agriculture Improvement and Reform Act (Farm Bill) that provided the Department with \$200 million for ecosystem restoration, including land acquisition; and (iii) numerous annual Interior Appropriations Acts that have funded land acquisition at parks and refuges in the region, as well as additional state land acquisition assistance funds. The state assistance funds provided by the Department of the Interior have, for the most part, been targeted towards acquisition of lands that create additional opportunities for water storage and are generally expected to be incorporated into a Comprehensive Plan project feature.

Through these efforts, it is estimated that \$1.6 billion has been spent to date (of which \$1.1 billion is state funding and \$0.5 billion is federal) for the acquisition of 4.7 million acres. It is estimated that about 638,000 non-Federal acres remain to be acquired in South Florida at an estimated cost of \$2.2 billion. These figures do not include the 220,000 acres of lands needed for the Comprehensive Plan implementation, which are included in the overall cost estimate for the Comprehensive Plan.

Critical Restoration Projects: Pursuant to the Water Resources Development Act of 1996, the Army Corps and the South Florida Water Management District have entered into agreements to undertake nine critical restoration projects that will provide immediate and substantial benefits for the ecosystem. The Corps and the Seminole Tribe have entered into a similar agreement for one critical project. The ten projects have a total cost of \$150 million, half of which will be paid for by the Federal government. These projects, although small and including such features as improving flows under the Tamiami Trail, have immediate environmental benefits that will assist in achieving the goals of the restoration.

Exotic Species Control: Commensurate with land acquisition is proper land management and efforts to eradicate and prevent the spread of invasive exotic plant species. More than 200 species of exotic plant species have invaded the Everglades. The majority of these species occur in limited areas, and do not pose a direct threat to native plant communities. However, plants like melaleuca, Brazilian pepper, Australian pine, and Old World climbing fern, are causing widespread damage throughout the South Florida ecosystem, and are considered species of primary concern. The South Florida Water Management District, state, and federal government are all directing resources to combat this problem. While areal coverage for some species will decrease with vigilant management efforts – which has been the case with melaleuca – new species could invade without additional management initiatives. The history of this problem indicates that management efforts will only intensify with time and should be considered a perpetual management requirement in the Everglades region.

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outcome-oriented goals. At this time, and based upon input from State of Florida stakeholders, the state is reviewing Goal 3, "transforming the built environment," including state proposals for managing growth. Because implementation of Goal 3 is largely viewed as a state responsibility and the State of Florida is considering how to address this issue, the Department is including only estimated Federal costs in support of the present goal. The Department expects that the completion of the Strategic Plan will result in an improved ability to report on costs to implement this goal.

V. Estimated Total Costs for the Restoration of the South Florida Ecosystem

This section presents the Department's best estimate for the total costs for South Florida ecosystem restoration. As noted earlier, these costs are comprised of: (1) major on-going programs, and (2) future planned activities that may change, based upon site specific designs and new information, or may require future Federal and/or state legislative authorization.

Finally, this report may not have captured all of the costs that could be categorized by some as meeting the goals of Everglades restoration. A sustainable environment will also need a diverse and balanced economy. The regional economy should continue to support traditional industries such as agriculture, tourism, development, fishing and manufacturing. It must ensure that these resource-dependent industries are compatible with restoration goals and will maintain or enhance the quality of life in built areas. It is difficult to quantify the costs of responsible development that would include such characteristics as redeveloping declining urban areas, roads, utilities, services, and light rail, to name a few.

Managing growth and development problems cannot be solved by each local government acting alone. Roads do not stop at city and county boundaries. Our major natural resources and ecosystems frequently encompass parts of many local jurisdictions. A decision by one local government to construct a major public facility or permit private development can have a significant impact on an entire region, and the collective decisions of all local governments affect the entire state.

Among its recommendations to Congress in July 1999, the Comprehensive Plan recommended a feasibility study to identify the dominant water and environmental resource issues in southwest Florida in view of robust population growth in the region and to develop potential solutions to any problems that may be identified. The Southwest Florida Study is being conducted by the Army Corps and the South Florida Water Management District. The study area includes all of Lee County, most of Collier and Hendry Counties, and portions of Charlotte, Glades and Monroe Counties. It encompasses approximately 4,300 square miles and includes two major drainage basins. It is likely that this feasibility study could recommend programs and costs that would support any of the goals of the restoration effort. At this time, however, no costs are included as they are not yet known.

In accordance with the Committee's direction, the Department expects to provide updates of this

information on at least a biennial basis, or more frequently should it be desired, so that all parties involved are aware of the significant Federal, state and local investments that are being made in this important effort. Following are estimated total costs, arranged according to the ecosystem restoration goals:

Goal 1: Getting the water right to restore a more natural water flow to the region while providing adequate water supplies, water quality and flood control

(\$ in millions)

Ongoing Project/Agency	Total Cost	\$ Thru FY00	\$ Balance to Complete
Modified Water Deliveries for Evg. Nat'l Park /see note 1			
National Park Service	135-212	63	72-150
Kissimmee River Restoration			
Army Corps of Engineers SFWMD	225 293	64 183	161 110
C-111 /see note 2			
Army Corps of Engineers SFWMD	85 96	40 96	45 to be determined
C-51/STA-1E /see note 3			
Army Corps of Engineers DOI (FY 98, STA-1E) SFWMD	205 (46) 35	107 (46) 35	98 to be determined 0
Army Corps Critical Restoration Projects			
Army Corps of Engineers SFWMD	75 75	14 14	61 61
Everglades Construction Project /see note 4			
SFWMD	506	246	260

Goal 2: Restore and enhance the natural system protecting natural habitats and reestablishing threatened and endangered species

(\$ in millions)

Ongoing Project/Agency	Total Cost	\$ Thru FY00	\$ Balance to Complete
Federal land acquisition for parks and refuges: /see note 1			
NPS:			
East Everglades Addition	104	104	0
Big Cypress Addition	41	41	0
Big Cypress Preserve	207	185	22
FWS:			
Archie Carr NWR	99	11	88
J.N. Ding Darling NWR	18	7	11
Pelican Island NWR	22	7	15
Lake Wales Ridge NWR	4	4	0
Florida Panther NWR	13	13	0
Florida Keys NWR	35	31	4
Crocodile Lake NWR	15	14	1
State land acquisition efforts /see note 2			
DEP/SFWMD	3,405	1,155	2,250
Exotic Species			
NPS, Hole in the Donut	75	12	63
DOI 1996 Farm Bill, Melaleuca Quarantine Facility	6	6	0
SFWMD /see note 3	4	4	0
Multi-species Recovery Plan			
FWS	26	8	18
Manatee Pass Gates			
Army Corps of Engineers	12	3	9

Ecosystem Restoration Monitoring /see note 5	NOAA/NOS	83	4	79
Federal Assistance for ecosystem land acquisition: /see note 6				
DOI (1996 Farm Bill)	193	193		N/A
DOI (P.L. 103-219)	4	4		N/A
DOI (FY 94 Supp.)	5	5		N/A
DOI (FY 95)	5	5		N/A
DOI (FY 98)	[46]	[46]		N/A
DOI (FY 99)	60	60		N/A
DOI (FY 00)	45	45		N/A
Lake Okeechobee Rest. Plan /see note 7				
SFWMD	39	0		39
Future Projects:				
Comprehensive Everglades Restoration Plan	[7,800]			
Federal	3,900	0		3,900
Non-federal	3,900	0		3,900
Subtotal, Goal 1	10,041	1,178		8,864

- Notes on Goal 1:
- Range of costs for the Modified Water Deliveries Project represents uncertainties associated with the ongoing NEPA process for project components, including the 8.5 Square Mile Area, and does not represent a final agency decision to select any alternative that is presently being studied.
 - C-111 is undergoing a GRR supplement. The original project estimate was \$155; however, this will increase based upon the final alternative selected. The Water Resources Development Act of 1996 provides for a 50 percent cost share.
 - STA 1-E/C-51W is reported separately, as it is a Federal responsibility. Further, an additional amount is required to complete land acquisition. That cost estimate is being developed.
 - Costs for STA 1-E, which is a Federal part of the Everglades Construction Project, are shown separately. Assumes 20 year restoration effort beginning in 2002.
 - FY 1998 funds for state assistance are included within estimate for C-51/STA 1-E project as the \$46 million appropriated was used to fund land acquisition costs for STA 1-E; the number is shown here as a non-add. Future DOI Federal funding assistance for state assistance, including the FY 01 budget request for \$47 million, is included within the future estimate for the Comprehensive Plan or State of Florida SOR/CARL land acquisitions, as lands that would be acquired would likely target implementation of these programs.
 - Does not include funds for sediment removal for Lake Okeechobee; cost estimate not yet developed.

Biscayne Bay Study					4
Army Corps of Engineers	6	2			
Florida Keys Water Quality					
EPA	410	12			398
Comprehensive Water Quality Protection Plan					
EPA	3	1			2
Research, including Cooperative Ecosystem Restoration Studies Initiative /see note 4					
NPS (CESI)	39	39			to be determined
NOAA/NMFS	86	10			76
NOAA/NOS	50	11			39
SFWMD	30	8			22
Subtotal - Goal 2	4,710	1,688			3,022

- Notes on Goal 2:
- For FY 01, \$0.2 million is requested to complete Florida Panther, NWR. The number does not show due to rounding.
 - These lands were acquired using state dedicated funding sources such as Save Our Rivers, Preservation 2000 and the Florida Forever Act, but do not include acreage or costs associated with donation of lands for Everglades National Park and Biscayne National Park.
 - Includes advanced treatment technologies research, research and research monitoring, and modeling for Florida Bay and adjacent waters and wetlands.
 - CESI research needs are being determined as part of the Strategic Plan; NOAA costs assume 20 year restoration effort.

Goal 3: Transform the built environment to develop lifestyles and economies that do not degrade the natural environment and improve the quality of life in urban areas

Note: As described in the text, this goal is being revised due to input from State stakeholders and no state cost data is available. However, Federal costs supporting the concept of this goal are shown below.

Ongoing Projects	Total Cost	\$ Thru FY00	Balance to Complete
Brownfield Redevelopment Grants			
EPA	13	3	10
Waste Water Treatment Facilities			
NPS, Everglades NP	38	5	33
Future Projects:			
Southwest Florida Programmatic EIS re: Clean Water Act Section 404 permits /see note 1			
Army Corps of Engineers	to be determined	to be determined	to be determined
Southwest Florida Feasibility Study			
Army Corps of Engineers SFWMD	4	3	1
	4	3	1
Subtotal, Goal 3	59	14	45

- Notes on Goal 3:
- This EIS is ongoing; costs to implement future recommended actions are not included at this time.

Appendix D: Additional Views of the Miccosukee Tribe of Florida

CONFLICTING PRIORITIES IN HYDROPERIOD RESTORATION AND THE LACK OF A VISION IN EVERGLADES RESTORATION

Dexter Lehtinen
Member, South Florida Ecosystem Restoration Task Force
August 26, 2002

The Task Force Report, while admirable in many respects, fails to address one of the central problems in Everglades restoration -- that is, the inherent and continuing conflict between agency programs or missions (including statutes) and the central goals of restoration (hydroperiod and water quality restoration). If these conflicts are not resolved in favor of hydroperiod and water quality restoration, and narrower agency advocacy of divergent goals is not eliminated, then Everglades restoration will fail. The Task Force Report's ambiguous reference to "short-term or interim management actions which are not immediately consistent with long-term goals" (pages 5 and 22) has been explained as (and should be properly understood as) referring to temporary adverse consequences of initial steps in implementing restoration projects. But it could be improperly twisted to justify adverse consequences of agency action which is not in any way an initial step or part of hydroperiod or water quality restoration. That is, some agencies directly damage hydroperiod and water quality for their own narrow goals (based on pre-existing agency missions or their interpretation of existing law).

When individual agency programs or missions conflict with broad restoration goals, the broad goals should prevail if restoration is to be achieved. This is a truth which neither agencies nor the Task Force are yet willing to face. In fact, the substitution of agency programs or missions over broad restoration goals is precisely the problem which restoration has unsuccessfully faced for many years and which has contributed to restoration delays and continued degradation.

Despite the apparent priority of hydroperiod (water levels) restoration to natural levels and water quality improvements, there are different agency goals or legal interpretations which conflict with or inhibit natural hydroperiod restoration. As a logical matter, it is clear that species which favor the current degraded and disturbed conditions of the Everglades will be adversely affected, in an immediate short-term sense, by natural hydroperiod restoration. It must be remembered that the current disturbed and degraded condition of the Everglades is "unnatural" because it differs from the historic natural conditions, which means that the Everglades is a "degraded habitat" when measured against historic natural conditions. The historic conditions were not favorable to species other than those species which thrived in such historic natural conditions.

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It both logically possible and factually demonstrable that certain species find the "degraded" habitat to be better for them than the natural habitat. Therefore, when restoration occurs, the movement from poor or "degraded" conditions toward "better" or natural conditions, is considered positive and progressive when measured against natural restoration standards. But this same positive movement instead constitutes a movement from good conditions toward poor conditions for any single species which currently favors the degraded conditions. Therefore, "habitat improvement" for the natural Everglades is instead "habitat degradation" for a single invasive species.

Natural restoration can occur only if natural restoration is given the priority over protection of the degraded habitat which a single species may favor. The long-term benefits of restoration must be accepted as superior to the short-term benefits of maintaining degraded conditions for the benefit of single species.

An outstanding example of such a problem is the current urging of the U.S. Fish and Wildlife Service (through Biological Opinions under the Endangered Species Act) to maintain unnaturally low water levels below Tamiami Trail (in Everglades National Park, south of the S-12 structures) in favor of the Cape Sable Seaside Sparrow, which favors such an unnatural habitat. This action has the secondary effect of maintaining unnaturally high water levels north of Tamiami Trail (in Water Conservation Areas and Miccosukee Tribal lands).

Charts #1 and #2 show that, under the actions sought by USFWS and proposed by the Corps of Engineers for 2002, water levels below Tamiami Trail will be lower than the Natural System Model shows would be natural conditions (the goal for restoration), while water levels north of Tamiami trail would be higher than the NSM shows would be natural conditions. The charts also show that the C&SF Project regulation schedule, the water management regime normally in effect prior to interim actions proposed for the sparrow, were likewise the cause of unnaturally low water south of Tamiami Trail and unnaturally high water north of the Trail -- but that the current sparrow actions are worse than the regulation schedule, that the sparrow actions aggravate the unnatural conditions. That is, these actions, proposed and adopted subsequent to the establishment of restoration goals, move away from restoration rather than toward restoration.

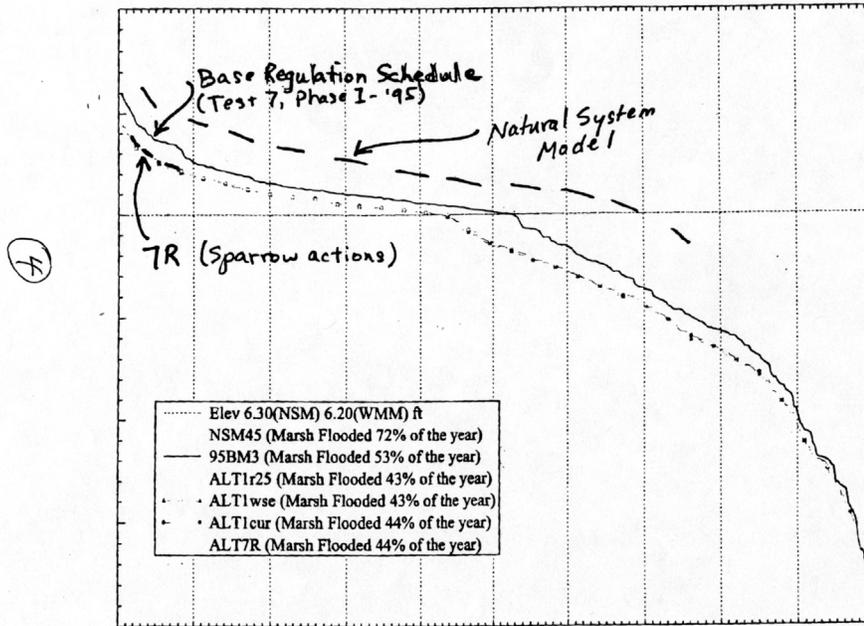
This regression away from restoration highlights the common myths of Everglades restoration: (1) The Myth of a Restoration as the Priority (the false belief that everyone seeks restoration as a common priority); (2) The Myth of Progress (the assumption that at least we're making progress toward restoration, that what we're doing is helping); (3) The Myth of Money (the common claim that the main impediment to restoration is money); (4) The Myth of the General Federal Interest (the assumption that the federal government represents a general interest in overall restoration, rather than a narrow special interest; also the Myth of the Park,

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the federal working premise that "Everglades" means just "Everglades National Park", not the larger Florida Everglades to the north); and (5) The Myth of a Shared Vision (the assumption that everyone seeks a return to natural conditions, rather than new conditions favorable to their special interest). Until these myths become reality, Everglades restoration will not and cannot be achieved.

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Normalized Stage Duration Curves at Cell (R19 C16) ENP Gage NP205

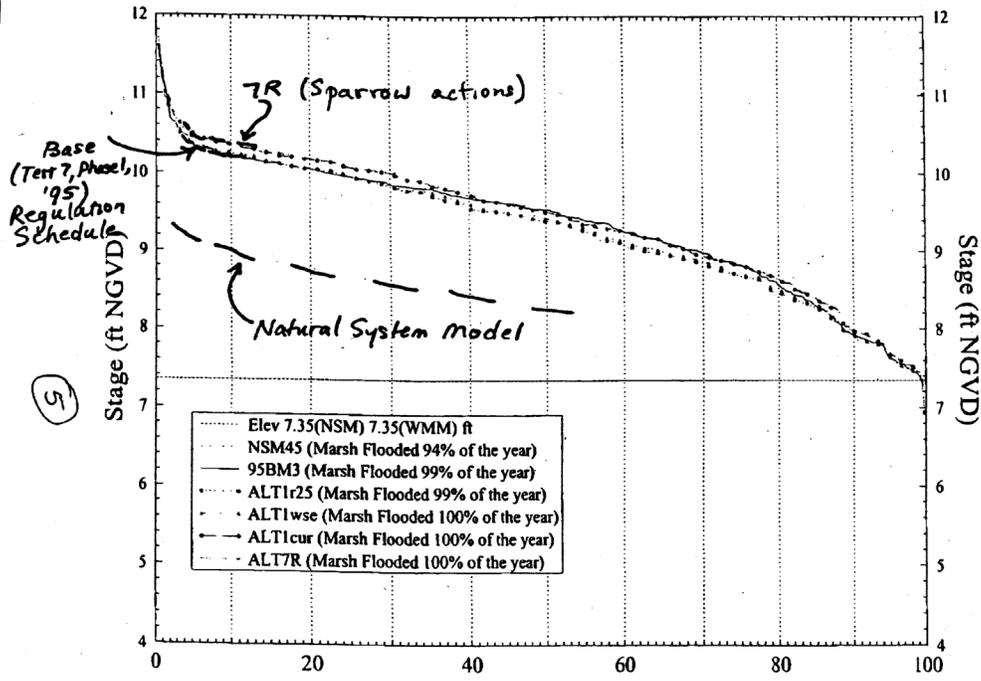


(South of S-12 Structures and south of Tamiami Trail)

Note: Normalized stage is stage referenced to Land Elevation. Thus, values above zero indicates ponding
..... indicates depth to the water table.

Run date: 08/08/02 00:48:58
Continuous Analysis
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Stage Duration Curves at South End of WCA-3A (Gage 3A-28, Cell R24 C19)



(Southern WCA 3 A -- north of Tamiami Trail and S-12 structures)

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Continuous Analysis
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Appendix E: Integrated Science Plan and Science Program/Project List

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129 CURRENT HYDROLOGICAL AND ECOLOGICAL RESEARCH PROGRAMS IN SOUTH FLORIDA

129 NOAA: South Florida Ecosystem Research and Monitoring Program (SFP)

131 DOI: Everglades National Park Critical Ecosystem Studies Initiative (CESI)

132 DOI: USGS Greater Everglades Science Program, Place-Based Studies (PBS)

133 DOI: USFWS Multi-Species Recovery Plan (MSRP)

133 SFWMD: Okeechobee / Everglades / Florida Bay Watershed Management Program

Introduction

This Integrated Science Plan (ISP) provides an organizing framework of scientific information and knowledge needed by managers and policy makers restoring the South Florida Greater Everglades ecosystem. This framework formalizes a multi-institutional network through which collective efforts are focused and information is shared. Timely scientific information must be available to guide decisions at each of a series of critical stages in the redesign of the Central and Southern Florida (C&SF) Project. The term "science" in this context includes biological, chemical, physical, and social sciences, because all play an integral role in development of a sustainable restoration plan.

Scientists have two distinct roles in the restoration process. The first role is to ensure that the best existing scientific knowledge is available in the planning and decision making processes. The second role is to acquire critical new information necessary to reduce uncertainty and improve the probability of meeting restoration goals. Scientists must provide timely and well-focused scientific information in an appropriate form to ensure that the best scientific knowledge currently available is used to plan and evaluate restoration actions. It is critical that scientists be actively engaged in the restoration process while, at the same time, their scientific investigations augment knowledge about the ecosystem. It is also critical that managers and regulators be aware of scientific recommendations. Decisions are being made continuously in the multiyear process of project design and implementation, and a scientific basis for these decisions is the key to restoration success.

BACKGROUND

The ecological integrity and functionality of the Greater Everglades and coastal ecosystems is the theoretical target for restoration. The natural system supported clean and abundant water supplies, large populations of wading birds, fish, and other wildlife, and landscape patterns that made South Florida's Greater Everglades and coastal

ecosystems unique. Using quantitative estimates of natural system conditions as theoretical targets for the remaining natural areas will ensure that changes brought about by restoration efforts are in the right direction. This approach does not favor one species or community over another, but rather the mix of species that occurred here naturally. The objective of restoration is to recapture the defining characteristics of the diverse ecosystems within South Florida's Greater Everglades and coastal landscape.

Hydrologic restoration is viewed as an important prerequisite to ecosystem restoration. For this reason, the Comprehensive Everglades Restoration Plan (CERP), which is a redesign of the C&SF water management project, is the keystone of the restoration process. However, other measures, such as water quality improvement, also will be necessary. The working hypothesis of the South Florida ecosystem restoration effort is that a restored, sustainable ecosystem will follow from restoring a more ecologically beneficial hydrologic regime, improving water quality, recovering natural fire patterns, and controlling exotic species. In reality, because of the fifty percent reduction in the spatial extent of the Everglades and the irreversible changes to South Florida's wetlands, complete restoration is not possible. Rather, the restoration program is expected to shift the currently degraded system substantially in the direction of a natural system. How far the shift occurs towards natural composition and function depends on employment of an adaptive assessment process being implemented under the CERP. This is a process whereby projects are evaluated, refined, and supported by a strong, continuous multi-agency scientific research program and a comprehensive regional monitoring program.

OBJECTIVES

The following systemwide objectives for South Florida ecosystem restoration were recommended in a 1993 Science Subgroup Report. They are equally applicable today. The purpose of this ISP is to organize the scientific basis for achieving these regional-scale objectives:

- Restore water quality by reducing nutrients and contaminants.
- Restore natural relationships between rainfall and hydro patterns.
- Restore timing and volume of freshwater flow through the system and into estuaries.
- Restore natural sheet flow, reduce compartmentalization, and restore inter-regional linkages.
- Restore dynamic water storage capacity.
- Reduce habitat fragmentation and restore ecological connections.
- Reestablish sustainable locally breeding wildlife populations.
- Recover endangered and threatened species.
- Halt/reverse expansion of invasive nonnative plant species.
- Halt/reverse expansion of invasive nutrient-loving native plant species.
- Increase spatial extent of wetlands.
- Increase natural biological diversity and landscape heterogeneity.
- Restore native vegetation communities, replacing lost communities.
- Restore natural periphyton communities.
- Restore coral cover.
- Restore biological productivity of wetlands, estuaries, reefs, and fisheries.
- Restore self-maintaining properties of natural and human systems.
- Increase the beneficial linkages of agricultural, urban, and natural ecosystems.

APPROACH

Issues associated with restoration of South Florida's natural systems are so large in scale and so geographically, ecologically, and socioeconomically complex that a broadly integrated planning and coordinating process is necessary to address them.

Natural and social scientists must pursue innovative approaches that will concurrently strengthen both human and environmental goals and acknowledge the concerns of the various interest groups. With so many issues, scientific disciplines, and stakeholders involved, a collaborative, scientific process must be utilized to seek consensus on the diverse set of technical issues for the restoration effort to be successful.

The ISP provides a framework for future detailed planning. It assumes that restoration goals can only be achieved through multidisciplinary and multi-agency cooperation in identifying and resolving complex technical issues. The scientific community will make its strongest contributions by employing inclusive processes to create scientific consensus positions on the major issues. The Science Coordination Team (SCT), organized under the South Florida Ecosystem Restoration Task Force Working Group (the working group), has the lead responsibility for encouraging and coordinating integration of all scientific efforts conducted in support of the South Florida ecosystem restoration.

SCIENCE ROLES

The two major goals for utilizing science in the South Florida restoration effort are (1) to acquire new information required to fill gaps in scientific knowledge critical in meeting the restoration goals, and (2) to create real-time data-collection networks by which scientists can support managers and policymakers in planning, monitoring, and evaluating restoration programs. The parallel processes addressing these goals are linked through the development and application of conceptual ecological models specifically developed for South Florida ecosystems.

Science Coordination Structure

A science coordination structure has evolved to coordinate the acquisition and synthesis of scientific knowledge and to facilitate interaction between the scientific and management communities in planning and evaluating projects related

to restoration. The science coordination structure consists of four science groups or entities.

SCIENCE COORDINATION TEAM (SCT)

The SCT, established by the working group facilitates integration and coordination of the interagency science program and science application. Membership on the SCT is from agencies and entities of the working group and members of the public.

Selection of SCT Priorities for FY2000-2001

Throughout its first three years of operation, the SCT realized that the original charter was ambitious, given the amount of financial and human resources dedicated to the effort. In order to become more effective and to realistically assess its capabilities, the SCT began a prioritization process in February 2000, with a list of almost sixty possible priorities. Following much discussion and deliberation, the SCT narrowed the possible priorities down to eighteen topics. The SCT further prioritized these topics using the following criteria: topical scope, short- versus long-term commitment, a realistic assessment of the amount of time each SCT member can contribute to any priority topic, and timing relative to restoration needs.

In May 2000, after a discussion of each topic, the following five topics were selected as priority science issues for FY2000-2001: (1) planning and implementation of the Greater Everglades Ecosystem Restoration Conference (GEER); (2) support for the Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE); (3) water quality; (4) the role of science in the CERP (through participation in Restoration Coordination and Verification (RECOVER) Team activities; and (5) water flow, function, and topography. Some details on several of these topics are briefly described in some of the following sections of this report.

REGIONAL SCIENCE GROUPS

Regional science groups have been developed in

several subregions in South Florida where a number of federal and state agencies and universities are working and share jurisdiction. The prototype for these regional science groups has been the Program Management Committee (PMC) for the Interagency Florida Bay Science Program. This PMC has been coordinating research in Florida Bay since 1994 in accordance with a strategic science plan organized around five central questions related to the structure, function, and restoration of Florida Bay. This PMC consists of designated representatives of the state and federal agencies conducting or funding research in Florida Bay, and it receives guidance from a standing scientific oversight panel whose members attend the Florida Bay Science Conference and topical workshops and regularly review the strategic science plan. Recently the working group requested this PMC to expand its coverage to adjacent coastal areas and to include agencies conducting research in Biscayne Bay and along the southwest coast (coastal portions of subregions 3 and 5). A subcommittee of this PMC has begun to develop a strategic science plan for Biscayne Bay.

Following the Florida Bay PMC prototype, the Southwest Florida Science Group has prepared a regional science plan for subregion 5. Other subregional science plans, also following the PMC prototype, are being developed for the subregions where science information needs require coordinated multi-agency science programs.

NATIONAL ACADEMY OF SCIENCES

In coordination with the South Florida Ecosystem Restoration Task Force (the task force), the National Academy of Sciences created the Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE). CROGEE is charged with providing a multiyear, systemwide peer review of the science underpinning of the CERP, and with reviewing the science processes used to support other South Florida restoration programs. CROGEE is linked to the SCT through a liaison team established by the task force executive office, the working group, and the SCT.

RECOVER (RESTORATION COORDINATION AND VERIFICATION) TEAM

RECOVER is the primary entity responsible for application of scientific knowledge to planning and implementation of CERP water-management projects. The role of RECOVER is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of the CERP. RECOVER links science and the tools of science to a set of systemwide planning, evaluation, and assessment tasks. These links provide RECOVER with the scientific basis for meeting its overall objectives of evaluating and assessing CERP performance, refining and improving the plan during the implementation period, and ensuring that a systemwide perspective is maintained throughout the restoration program.

In order to establish and maintain an effective link between science and the CERP, the Central and Southern Florida Project Restudy Team created a process known as the Applied Science Strategy. The RECOVER team is responsible for the coordination and application of the components of the Applied Science Strategy during the implementation of the CERP. The major components of the science strategy are conceptual ecological models, performance measures and restoration targets, a systemwide monitoring and research program, and an adaptive assessment protocol.

RECOVER comprises six multi-agency and multidisciplinary task teams organized by the Corps of Engineers and its local sponsor, the South Florida Water Management District (SFWMD), to help implement the CERP. The structure of RECOVER is described in detail in the implementation plan for the CERP. A brief description of the six teams follows. To facilitate cooperation and coordination between the SCT and RECOVER, some scientists serve jointly on the SCT and RECOVER teams.

Adaptive Assessment Team (AAT)

The Adaptive Assessment Team primarily is responsible for creating, refining and providing the Monitoring and Assessment Plan (MAP). The MAP contains a description of regional monitoring plans for Lake Okeechobee, the northern estuaries (Caloosahatchee and St. Lucie), the greater Everglades basin (Everglades ridge and slough, Everglades marl prairies, southern mangrove estuaries, eastern big Cypress), and the southern estuaries (Florida Bay and Biscayne Bay), water quality, and water supply and flood protection. The MAP also documents a set of conceptual ecological models for the total system and for each of the major physiographic regions of South Florida. The AAT also creates and refines a set of attribute-based biological performance measures for the CERP. Another important function of the AAT is to design and review the systemwide monitoring and data management program needed to support the CERP. The AAT uses the information coming from the systemwide monitoring program to assess actual system responses as components of the CERP are implemented. Finally, the AAT produces an annual assessment report describing and interpreting these responses.

Regional Evaluation Team (RET)

The Regional Evaluation Team of RECOVER primarily is responsible for reviewing and revising the set of systemwide stressor-based performance measures and restoration targets and for resolving technical issues pertaining to the performance measures. The RET also conducts systemwide analyses of the CERP using the latest refinements in predictive tools (e.g., SFWMM, ELM).

Model Development and Refinement Team (MRT)

The Model Development and Refinement Team is charged with the overall task of ensuring that the predictive tools used to conduct the evaluations of the CERP components are consistent with the scales and targets set by the performance measures for each component. This team oversees the quality of physical, water quality, and ecological models and coordinates the resolution

of technical issues pertaining to the models. Any necessary refinement or enhancement of systemwide tools (e.g., the South Florida Water Management Model) will also fall under this team's purview.

Water Quality Team (WQT)

The Water Quality Team has the responsibility for coordinating the Applied Science Strategy for water quality, and for developing and implementing a water-quality strategy at both the regional and project levels. It crosses all other RECOVER teams' responsibilities by providing the water quality component to their products, as well as having responsibility for independent projects. Tasks of the WQT include the development and review of water-quality performance measures, development of the water-quality components of the CERP systemwide monitoring plan, providing input into the annual assessment of system responses, particularly as they relate to water quality, and serving as a link between RECOVER and project delivery teams to ensure local water quality for projects is appropriately addressed and coordinated with systemwide water-quality performance measures and targets.

Operations Planning Team (OPT)

The Operations Planning Team has the lead role for coordinating and resolving systemwide operational issues associated with the implementation of the CERP. The team supports the Project Delivery Teams in the design of operational criteria and water control plans for each of the CERP components. The OPT also works with the Adaptive Assessment Team in reviewing hydrological responses during the implementation period. It also coordinates or recommends interim operational criteria wherever these changes may provide enhancements in the performance of the plan before all components of the plan are in place.

Comprehensive Plan Refinement Team (CPR)

The Comprehensive Plan Refinement Team has the lead responsibility for recommending refine-

ments and improvements to the CERP throughout the implementation period, as new information that identifies where, how, and why these improvements should be made becomes available. It links closely with other RECOVER teams to identify needed plan refinements and a means for incorporating these refinements into the design. The CPR team is an ad hoc team that is formed each time there is a need to address a systemwide performance issue.

Building Scientific Knowledge

CONCEPTUAL ECOLOGICAL MODELS

RECOVER manages the development of ten conceptual ecological models proposed by interdisciplinary science teams. These conceptual models, identified below, identify societal drivers (e.g., water management), resulting ecological stressors (e.g., altered hydropatterns), and their effects on ecological systems (e.g., reduced fish production). They are more like risk-assessment models than quantitative ecological models. They are designed to focus attention upon the restoration hypotheses explaining the currently degraded condition of various ecosystems or regions in South Florida. Each model identifies principal biological attributes (e.g., endpoints and indicators) that characterize the "health" of each landscape or ecosystem and reflect important ecological and societal values of the system. Formulation, examination, and refinement of hypotheses embedded in the models are expected to become the primary means for identifying gaps in current knowledge, setting future research priorities, and guiding modifications to restoration efforts. Research priorities established during the conceptual ecological model workshops addressed specific scientific needs associated with modeling, monitoring, and cause-and-effect scientific studies. Emphasis of new work will be on filling information gaps. The conceptual ecological models are dynamic and are being reviewed continually and revised as additional data and knowledge about the ecosystem and its response to restoration efforts emerge. Beyond the CERP, recommendations developed through this process are presented to the working group through the SCT.

The ten conceptual ecological models (nine physiographic regions plus one total system model) are thoroughly described in the MAP developed by the RECOVER AAT. The ten conceptual ecological models are listed below:

- Everglades Ridge and Slough Conceptual Model
- Everglades Calclitic Wetlands Conceptual Model
- Big Cypress Conceptual Model
- Everglades Mangrove Estuary Conceptual Model
- Florida Bat Conceptual Model
- Biscayne bay Conceptual Model
- Caloosahatchee Estuary Conceptual Model

- St. Lucie Estuary and Indian River Lagoon Conceptual Model
- Lake Okeechobee Conceptual Model
- Total System Conceptual Model

The review of these conceptual ecological models by the interdisciplinary science teams identified common issues, hypotheses, and linkages across the models, which grouped into five major themes or restoration expectations. Each of the five themes was developed into an integrated monitoring and assessment package. The five packages constitute the framework of the MAP and cover several physiographic regions as shown in the following table:

MAP Package	Physiographic Regions
<i>1. WETLAND LANDSCAPE PACKAGE</i>	1. Ridge and Slough 2. Calclitic Wetlands 3. Big Cypress 4. Mangrove Estuary
<i>2. WETLAND TROPHIC RELATIONSHIPS PACKAGE</i>	1. Ridge and Slough 2. Calclitic Wetlands 3. Big Cypress 4. Mangrove Estuary
<i>3. ESTUARINE EPIBENTHIC COMMUNITIES, HABITATS, AND INDICATORS PACKAGE</i>	1. Florida Bay 2. Biscayne Bay near-shore Environment 3. Mangrove Estuary Coastal Lakes 4. Caloosahatchee Estuary 5. St. Lucie Estuary / Indian River Lagoon 6. St. Lucie Headwater
<i>4. EFFECTS OF STAGE AND PHOSPHORUS ON LAKE LITTORAL AND PELAGIC ZONES PACKAGE</i>	1. Lake Okeechobee
<i>5. BIOTA OF SPECIAL CONCERN PACKAGE (NOT COVERED BY OTHER PACKAGES)</i>	1. Crocodile (Biscayne Bay and Mangrove Estuary) 2. Cape sable Sparrow (Calclitic Wetlands) 3. Manatee (Biscayne Bay and Caloosahatchee) 4. White-tailed Deer (Big Cypress) 5. Dolphin Health (Biscayne Bay) 6. Fish Health (Biscayne Bay and St. Lucie/Indian River Lagoon)

COMMUNICATION

The SCT facilitates communication among the many scientists and agencies conducting or supporting restoration program science. Multidisciplinary science conferences have been organized to present ongoing research, while topical workshops have been used to focus an exchange of information and ideas on specific technical issues. For example, in 1999 the SCT sponsored the South Florida Ecosystem Restoration Science Forum to promote communication between scientists and managers. The SCT scheduled the Greater Everglades Ecosystem Restoration Science Conference in December 2000, with the primary focus of facilitating exchange between scientists. The Science Forum and Science Conference are sponsored in alternate years.

INTEGRATED DATA MANAGEMENT

An inventory of all monitoring activities occurring throughout the CERP area was completed by a private contractor in April 2002 under a contract with the Corps of Engineers. All hard copies of data received by the contractor were manually entered into a database. The contractor also committed to merge the four metadata (data about the data) databases made available by different state and federal agencies. The final inventory report produced by the contractor has an index of the monitoring data and a bibliography with approximately 8,000 entries. Other inventories are being conducted, and available databases are being archived in a multigovernmental database-management system accessible through the Internet. Metadata also are being compiled and supplied through the USGS South Florida Information Access (SOFIA) web site (<http://www.sofia.usgs.gov>). SOFIA is routinely enhanced and updated and has become one of the most complete databases on restoration related science projects. A guide to the information available from each database is available and continually updated. The process of accomplishing this critical activity was initiated with a multi-agency metadata workshop organized by the USGS under the aegis of the SCT in March 2000.

Applying Scientific Knowledge

An applied science strategy is being used to help plan and evaluate restoration projects. This science strategy was initially applied in the selection of alternative and improved redesigns of the South Florida water management system to help restore the ecological health and integrity of the Everglades. In addition, a multi-species management plan was developed to ensure that the future of each threatened and endangered species is evaluated in the context of the future quantity and quality of its habitat.

APPLIED SCIENCE / ADAPTIVE ASSESSMENT STRATEGY

A science-based strategic process has been designed to provide a comprehensive framework for organizing existing scientific information and knowledge about the natural systems in South Florida into formats which are most applicable to the planning, evaluation, and assessment of restoration projects at regional and systemwide scales.

The applied science / adaptive assessment strategy has five major components: (1) development and continuous improvement of conceptual models based on current scientific knowledge, (2) development and updating of performance measures for key stressors and attributes (indicators) in the conceptual models, (3) design of a systemwide science program that consists of (a) long-term monitoring and data collection to track ecosystem status and trends, (b) cause-and-effect scientific studies designed to increase understanding of ecosystem responses to restoration, (c) simulation modeling to provide a framework for assessing the degree of scientific understanding, and (d) peer review to ensure high-quality and credible science, (4) annual assessment, based upon monitoring these performance measures, of the degree to which restoration is meeting expectations, and (5) providing feedback to planners and engineers on where modifications in design are needed to meet targets.

Each component depends on the creation of scientific consensus, achieved through a series of

technical workshops organized across multi-agency and multidisciplinary lines and the use of an independent peer review process. Research will be required (1) to reduce uncertainty in predictions, (2) to understand the causes of change, (3) to distinguish causal connections from chance correlations, and (4) to explain change that is not exactly as predicted. Simulation models developed in the science program will be used in this adaptive process to help predict how well specific restoration plans can be expected to meet the targets set for the performance measures and to interpret measured responses against a background of annual and internal variation in major influencing environmental factors, such as rainfall.

APPLYING CONCEPTUAL ECOLOGICAL MODELS

The ultimate purposes of the conceptual ecological models are (1) to convert the broad, policy-level objectives that have been established for each restoration program into specific, measurable indicators, (2) to develop a suite of hypotheses that describe the major ecological responses to the restoration projects, and (3) to use the models to identify the performance measures needed to evaluate each restoration plan. The hypotheses become the basis for the restoration plans by identifying the improvements in hydrologic conditions and water quality that are necessary to achieve the restoration objectives. These conceptual models identify the major stressors and biological attributes (e.g., indicators) expected to best characterize the system's response to specific restoration actions. Hydrologic and biologic performance measures and a systemwide ecological monitoring program will be based on the relationships expressed in these conceptual models.

As specific restoration projects are planned and designed, simulation models are used to predict how well each alternative plan is likely to perform. Once the selected plan is implemented, a well-focused monitoring program will measure how well the key attributes in each system respond, according to their performance measures. Cause-and-effect scientific studies will increase understanding of ecosystem responses to

restoration, particularly if responses are contrary to those predicted. The simulation modeling and the monitoring provide an objective means of testing the validity of the conceptual models and hypotheses, reducing scientific uncertainty, identifying new research priorities, and modifying restoration actions. This, in effect, is adaptive assessment.

PERFORMANCE MEASURES

Developing performance measures requires the identification of a set of biological and physical parameters that collectively represent the response of the system to restoration efforts over a range of spatial, temporal, and ecological scales. Performance measures were used in the feasibility phase of the CERP (the "Restudy") to evaluate proposed alternative redesigns of the water management system. Performance measures will be used in the implementation phase of the CERP to evaluate how well specific parts of a project, once implemented, are meeting the fundamental restoration objective of restoring ecological integrity.

Performance measures used in the feasibility phase of the CERP were largely hydrological. Through RECOVER, ecological performance measures have since been developed for each of the attributes in the conceptual ecological models. These attributes include the combination of populations, species, guilds, communities, and ecological functions that collectively can represent the response of the system to restoration projects. Performance measures identify, for each attribute, the numerical, spatial, temporal, or organizational targets that serve as the foundation for determining the success of specific restoration projects.

SYSTEMWIDE SCIENCE PROGRAM

The SCT is assisting the AAT in implementing a systemwide science program for restoration projects. The systemwide science program being developed has four components: (1) a long-term monitoring and data collection program, (2) cause-and-effect scientific studies, (3) simulation

modeling, and (4) peer review. The science program will establish base line and trend data for a common set of biological and hydrological parameters and will address cause-and-effect relationships between restoration implementation and ecosystem response.

The systemwide science program is also being designed to build on current hydrological and ecological research programs being conducted by federal and state agencies in South Florida. Some of these research programs are briefly described below. Existing programs are regularly reviewed for compatibility of protocols, completeness of spatial and temporal coverage, and their adequacy relative to the proposed set of performance measures. Integration of the current science programs is expected to reveal the need to initiate new science projects, expand some existing projects, and terminate lower priority projects. Science programs will best reveal system responses to restoration projects if science is focused on performance measures specific to restoration.

Current Hydrological and Ecological Research Programs in South Florida

Some of the most important hydrological and ecological research programs currently being conducted in South Florida include those from the National Oceanic and Atmospheric Administration (NOAA); the Department of the Interior (DOI) through the National Park Service (NPS), the U.S. Geological Survey (USGS), and the U.S. Fish and Wildlife Service (USFWS); and the South Florida Water Management District (SFWMD).

NOAA: SOUTH FLORIDA ECOSYSTEM RESEARCH AND MONITORING PROGRAM (SFP)

At about the same time that the task force was convened, NOAA began developing a management plan for the Florida Keys National Marine Sanctuary (FKNMS), and a regional coastal science plan to respond to the late 1980s ecological changes in Florida Bay and its valuable fisheries nursery area, largely upstream of the sanctuary.

The resulting SFP was specifically developed to address NOAA's responsibilities in the region, be consistent with the priorities of the restoration process, and be complementary to other state and federal programs that comprise the Interagency Florida Bay and Adjacent Marine Systems Science Program (FBAMS). The SFP commenced in 1994 and is expected to continue over the coming decades as South Florida ecosystem restoration is implemented. Projects are being conducted by federal investigators associated with the Ocean and Atmospheric Research / Atlantic Oceanographic and Meteorological Laboratory (OAR/AOML) and the National Marine Fisheries Service / South East Fisheries Science Center (NMFS/SEFSC), and by an extensive network of regional academic investigators.

Given the incomplete knowledge of the system and additional factors that defy rigorous prediction, a sophisticated and spatially extensive program of monitoring, research, and modeling in coastal ecosystems is needed to protect these systems through adaptive management. NOAA's basic mandates require that we address this need in light of the CERP, the Magnuson Act imperative to protect essential fishery habitat, and the recently implemented Tortugas Ecological Reserve, with its relatively pristine waters, as well as the growing list of federally protected marine species.

Activities currently underway in NOAA's SFP to address NOAA and SFER/CERP priorities, which were specifically designed to complement other research and monitoring activities ongoing in the region, can be categorized into the following areas: scientific programs (long-term observations, targeted ecosystem research, socioeconomic research, data and information synthesis, and modeling) and programmatic elements (education and outreach and regional program integration). These activities are explicitly consistent with priorities expressed by peer reviews conducted by the Science Oversight Panel (SOP) for the Interagency Florida Bay and Adjacent Marine Systems Science Program (FBAMS), the Science Advisory Panel (SAP) of the FKNMS, and the National Research Council's CROGEE.

Activities specifically include the monitoring and assessment elements that the CERP Monitoring and Assessment Plan assumes will be the responsibility of NOAA.

NOAA's research projects, administered by National Oceanic Service / Center for Sponsored Coastal Ocean Research (NOS/CSCOR) and supported with funds provided by NOS/CSCOR, OAR/AOML, and NMFS/SEFSC, were selected on the basis of an open competition via an announcement of opportunity in the Federal Register, followed by a technical mail review and panel evaluation of proposals. NOAA's financial contribution to the overall SFER/CERP efforts has not been great. However, with regard to the coastal marine ecosystem, NOAA has consistently exercised leadership and has been the major contributor to the interagency science effort. NOAA is specifically responsible for the coastal marine ecosystem, its living marine resources, its protected species, and the FKNMS, including the recently implemented Tortugas Ecological Reserve, the nation's largest marine reserve. The NOAA SFP established a coordinating office in Key Largo with an executive director. Its program manager (and a satellite office) are located in Miami at OAR/AOML.

While NOAA is specifically responsible for the coastal marine ecosystem and its living marine resources, additional federal, state, county, and municipal agencies all contribute and collaborate in significant ways. To note just a few of these contributions, three national parks encompassing coastal waters have their own science programs; FKNMS staff is involved in coordination of these programs within the NPS and with NOAA. The USGS conducts a range of coastal zone dynamics, paleoecological, groundwater, and geological studies. Florida state agencies include the SFWMD, the Florida Department of Environmental Protection (FDEP), and the Fish and Wildlife Conservation Commission's Florida Marine Research Institute (FMRI). The FMRI has a regional facility in the Florida Keys and conducts programs in ecosystem assessment and restoration and fisheries assessment, which con-

tribute substantially to our knowledge of the South Florida coastal ecosystem.

The specific elements of the NOAA SFP Program are described in greater detail, below.

Long-term Observations

NOAA is supporting long-term observations of physical conditions, water quality, key benthic habitats, and key populations of fishery species, associated fish communities, and protected species provides resource managers with fundamental information about spatial and temporal patterns and variation of ecosystems, as well as interrelationships. Patterns in these data can show managers where focused ecosystem studies are needed to elucidate mechanisms underlying particular patterns and, in particular, to investigate anthropogenic and natural effects on ecosystem processes. Knowledge of patterns and processes enables managers to determine whether management actions are feasible and likely to have the intended effect.

Targeted Ecosystem Research

Studies underway comprise research to elucidate mechanisms underlying spatial and temporal patterns of ecosystems and fisheries as documented by long-term observational projects. Such studies are necessary to meet agency mandates, as identified in management plans and other documents that identify agency resource management priorities. Once there is sufficient knowledge of an ecosystem, managers can identify particular physical, chemical, and biological processes that merit directed investigations relevant to high-priority management objectives. These studies are essential to a management-directed understanding of South Florida coastal ecosystems. Targeted studies are also needed to develop appropriate performance measures with which to evaluate design alternatives in CERP and monitor coastal effects of project elements as they are implemented.

Our basic understanding of marine ecosystems lags far behind our knowledge of terrestrial and freshwater systems. We therefore cannot rely

entirely on existing targeted studies to meet all our needs for science-based management. Peer reviews by the SOP, SAP, and CROGEE identify areas of research that need high-priority attention by funding agencies and the research community.

Socioeconomic Research

We know in general terms that the South Florida environment is a major contributor to the region's economy through tourism, recreational activities, and commercial fishing. However, we do not have an understanding of likely socioeconomic changes as a result of the CERP and associated environmental changes in Florida Bay and adjacent areas. Paleoecological studies have provided indications of changing floral and faunal distributions in association with past freshwater-management practices. This information and additional sources are being utilized in socioeconomic research to improve our understanding of consequences of the CERP to the South Florida economy. The program is in its infancy and will we expect be markedly extended over the next few years.

Modeling

Modeling studies need to be conducted to improve our understanding of coastal ecosystem processes and how these processes are influenced by human activities. Models are fundamental to developing predictive capability. They enable an analysis of the completeness of parameters provided by long-term observations and targeted ecosystem and fisheries studies. In South Florida, models are needed to organize and integrate existing information, indicate critical information gaps, build knowledge, evaluate alternative CERP designs, and help interpret data obtained from monitoring. Models are an essential component of adaptive management. Both physical and ecological models are needed for Florida Bay and other coastal systems.

Data and Information Synthesis

Efforts are underway to collect the data and information necessary to be used in developing

comprehensive synthesis reports and products that are specifically designed to present scientific understanding of the South Florida ecosystem in forms that are both useful and understandable to restoration and resource managers. These synthesis products will provide the basis for evaluating the efficacy of CERP scenarios and measuring the effectiveness of current studies, and will guide the planning of future research and monitoring efforts.

Education and Outreach

A program of education and outreach is essential to provide a communication link between the South Florida public and the research community. Information from the program will enable citizens to make science-based decisions on issues that affect the region's coastal environment, in particular the FKNMS, living marine resources, and issues concerning protected species. The program will also provide information about freshwater, estuarine, and marine issues in the region and objective information to help stimulate changes in behaviors in support of effective restoration of the South Florida ecosystem.

DOI: EVERGLADES NATIONAL PARK CRITICAL ECOSYSTEM STUDIES INITIATIVE (CESI)

The U.S. Congress appropriated funds during fiscal year 1997 to establish a new DOI Critical Ecosystem Studies Initiative (CESI) under the U.S. National Park Service to support the South Florida ecosystem restoration initiative. The superintendent of Everglades National Park (ENP), as CESI manager, has been charged with the responsibility of administering these funds and assuring that they have been applied in an appropriate manner, yielding sound scientific results that both improve the management of DOI lands in South Florida and significantly contribute to our regional restoration program. The executive director of the task force serves as the principal advisor to the CESI manager on the program. Within the initiative, major categories have been established that are supported by appropriations as described by the annual DOI Cross-Cut Budget. A CESI coordinator and pro-

gram category managers assist with the definition of science objectives, establishment of priorities, solicitation and selection of proposals and work plans, and coordination with federal, state, and local agencies to meet the goals and objectives of the initiative.

CESI supports studies conducted to provide physical and biological information, simulation modeling, and planning that are critical for achieving South Florida ecosystem restoration.

CESI supports major areas of ecological restoration related research, including investigations in the fields of coastal/estuary systems; contaminants and mercury bioaccumulation; ecological modeling, processes, and indicator species; hydrologic models; landscape patterns; and water-quality treatment.

*DOI: USGS GREATER EVERGLADES
SCIENCE PROGRAM, PLACE-BASED
STUDIES (PBS)*

The USGS PBS Program in South Florida was initiated in 1995 and provides objective integrated science for managers who are seeking to restore natural functions and values of resources and the environment. In order to restore these functions, managers must have scientific information to resolve the complex resource problems that are before them. Resource managers use scientific information for several purposes. First, it helps to define the extent of environmental problems, and to distinguish changes caused by management actions from natural changes caused by climatic shifts, environmental succession, and natural climatic variability. Second, understanding how the ecosystem functions helps managers formulate possible solutions to those problems. Third, ecosystem models provide tools for determining which proposed actions will be the most effective in resolving the problems. Fourth, scientific information is necessary to develop the criteria and strategy for monitoring the success of management modifications.

The goals of the PBS Program are (1) to provide relevant, high-quality, impartial scientific infor-

mation that permits resource-management agencies to improve the scientific basis for their decisions and to prevent or resolve resource-management conflicts and (2) to facilitate integration of scientific information.

Diversions of water and excessive nutrients and mercury within the Everglades have devastated bird populations and driven many species to the brink of extinction. In Florida Bay, declines in seagrasses, which hold sediment in place and provide habitat for fish, result in decreasing water clarity and declining fish populations. The U.S. Army Corps of Engineers (the Corps), the SFWMD, and other stakeholders are drawing up plans for restoring the Everglades and Florida Bay. USGS information and models help the Corps, the NPS, the FDEP, the EPA (U.S. Environmental Protection Agency), the USFWS, and the SFWMD predict the consequences of varied management alternatives, set ecological goals by providing yardsticks to measure the success of the restoration, and manage the natural resources of the system.

In FY 1999 the primary task of the USGS scientific program in South Florida shifted from primary data collection and research activities to enhancement of electronic availability of scientific information, and integration and synthesis of the scientific information that has been developed. The synthesis will integrate the accumulated scientific knowledge and understanding from USGS studies, help to chart the future scientific direction of the USGS program, and contribute to interagency synthesis activities to assist decision making for restoration of South Florida's ecosystem.

In the Everglades and Florida Bay, the USGS provides a broad suite of information and computer models to its clients and partners through the task force and associated work groups. USGS hydrologic models, monitoring data, and ecosystem history results are used by the Corps and SFWMD for detailed planning. USGS seepage models and data help to predict the potential for flooding of urban areas due to cutting through levees to protect an endangered species popula-

tion. Flows and water-quality information collected by the USGS will be used to help develop water-quality standards required before FY 2002 and monitor water flowing through land of the Miccosukee and Seminole tribes. USGS mercury information was used to develop a mercury monitoring plan by the SFWMD in FY 1999. USGS monitoring information and biological response models will be used by the Corps in a circulation model to estimate changes resulting from restoration. Communities in the Florida Keys use USGS information on nutrient and coral reefs to determine whether to modify their sewage-disposal practices. USGS information on Florida Bay is also used to refine the state's environmental monitoring programs and to improve the understanding of sediment resuspension and seagrass community changes. USGS hydrologic and geologic baseline information also helps determine water supply potential for increasing populations on the west and east coasts, and potential effects of reductions of water flow into Biscayne Bay National Park.

Specific USGS PBS in South Florida include the following research programs: ACME (Aquatic Cycling of Mercury in the Everglades); ATLSS (Across Trophic Level System Simulation); Ecosystem History; SICS (Southern Inland and Coastal Systems); and TIME (Tides and Inflows in the Mangrove Ecotone Model Development).

DOI: USFWS MULTI-SPECIES RECOVERY PLAN (MSRP)

A challenge for ecosystem restoration and an important science application issue is how to protect and enhance the status of over 60 federal and state listed species while, at the same time, altering regional hydropatterns to achieve landscape-scale recovery of natural systems. Population declines in most listed species are thought to have occurred due to loss or degradation of essential habitat. Some listed species have changed their ranges and habitats substantially in order to compensate for effects that urban, agricultural, and water-management practices have had on their original habitat. Responding to changes in water depth and distribution patterns,

these species have come to depend on different areas of the managed system than they used in the natural system. Although the overall expectation is that system restoration will improve habitat conditions for all listed species, the restoration implementation period may create short-term stresses on those species that may have to relocate again to adjust to restored hydropatterns.

The USFWS is leading the development of an integrated, comprehensive, multi-species recovery plan for the entire Kissimmee to Florida Bay basin. The purpose of the plan is to anticipate and plan for potential responses by listed species and to improve the design of the ecosystem restoration plans relative to recovery objectives. The MSRP identifies the strategies and thresholds that will best protect listed species in South Florida as regional ecosystem restoration programs are planned and implemented. The draft plan contains two sections. Part I consists of species accounts for all listed species, describing their biology and status and establishing the recovery goals and environmental compliance guidelines for each species. Part II relates the habitat requirements of the listed species to the landscape characteristics of South Florida, identifies specific land management actions necessary to recover listed species, identifies jeopardy thresholds, and proposes multi-species recovery strategies in the context of long-term objectives.

The Multi-Species/Ecosystem Recovery Implementation Team (MERIT) will develop an implementation plan for South Florida to prioritize the recovery actions as identified in the MSRP from an ecosystem perspective, and recommend and fund recovery and restoration activities.

SFWMD: OKEECHOBEE / EVERGLADES / FLORIDA BAY WATERSHED MANAGEMENT PROGRAM

The SFWMD's Watershed Management Program seeks to integrate the SFWMD mission responsibilities within a watershed context, that is, to incorporate watershed dynamics, ecosystem functions, and conservation biology into the deci-

sion-making process. The goals of watershed management are to (1) provide integrated scientific, planning and engineering support to assist policy makers with management decisions and project development; (2) ensure that scientific, planning, and engineering efforts are well-coordinated toward achieving water quality, water quantity, flood protection, and environmental restoration project goals; and (3) provide interdisciplinary management of projects from conception to completion. Watershed management efforts are under way in the South Florida ecosystem in the areas of nutrient enrichment; the effects of water level and flow management on wetlands, lakes, rivers, and estuaries; alternative water quality technologies; and predicting ecosystem responses to environmental restoration efforts.

SFWMD Successful Examples of Applied Science

A prime example of the Applied Science Strategy using adaptive management is the success story of the Everglades Nutrient Removal (ENR) Project. As part of the Everglades Forever Act (EFA) requirements, the ENR, an experimental marsh, was constructed to monitor and improve hydrologic, water quality, and vegetative conditions in the Everglades. Runoff from the Everglades Agricultural Area (EAA) was routed through an inflow canal for treatment in the ENR project. Phosphorus is naturally removed in aquatic systems by deposition and/or aquatic plants. As water passes through the ENR treatment areas, phosphorus levels are effectively reduced below 25 parts per billion (ppb). The information obtained from the ENR project was used to design and construct stormwater treatment areas (STAs), mandated by the EFA and key to improving water entering the Everglades system. The ENR Project's performance is constantly evaluated and new information is used to further restoration efforts.

Several research projects on the ability of cattail to invade the remnant Everglades have been completed. Cattail can survive and likely displace sawgrass under high-water conditions because cattail can pump air down into their roots to compensate for low-oxygen concentrations. However, this pumping ability comes at an energetic cost and requires additional phosphorus. These findings help explain why cattail invades the landscape so successfully under conditions of higher water levels and nutrient subsidies from fire, soil compaction, or stormwater enrichment.

Progress has been made toward understanding submersed aquatic vegetation in Florida Bay. It was previously thought that as Everglades restoration progressed, increased freshwater flow to Florida Bay might stress *Thalassia* seagrass (turtlegrass) beds by lowering salinity. However, healthy populations of *Thalassia* have been found in areas of maximum Everglades freshwater inflows, despite periodic low salinity and inflow of dark, tannin-colored waters that can reduce light levels in Florida Bay.

Research on the historical salinity in southern Florida Bay has formed the basis for the CERP Florida Keys Tidal Restoration Project.

Muck fire risk and wading bird nesting were combined to evaluate the ecological risks associated with alternative drought management plans.

Some of the SFWMD restoration projects include: Holey land regulation schedule, Rotenberger regulation schedule, STA monitoring and research, modified water deliveries project, C-111 project, long-term ecological research, Florida Bay minimum flows and levels, tree island hydrologic needs and research, wading bird hydrologic needs, water conservation area (WCA) historical tree island mapping and vegetation mapping, and ridge and slough research, among others.

SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE SCIENCE PROGRAM / PROJECT LIST

PROGRAMS									
Title	Project ID No.	PPM	Organization	Start	End	Financial Requirement	Appropriated to Date	Lead	
1 Charlotte Harbor National Estuary Program	GL45	Lutterman	EPA	1996	end	\$3,707,000	\$2,208,667	Rogers	
2 Indian River Lagoon National Estuary Program	GL 18	Neal	IFAS	1997	2002	\$2,000,000	\$500,000	call	
3 NOAA South Florida Science Program	TS96	Ortner	NOAA	1995	2010	\$40,000,000	\$9,600,000	Ortner	
4 Cumulative Effects of Natural and Anthropogenic Stressors	SE40	Goodyear	NOAA	1995	2001	\$6,250,000	\$4,450,000	Thompson	
5 Florida Keys National Marine Sanctuary: Sanctuary-wide and Zone Monitoring Programs	FK57	Keller	NOAA	1997	2002	\$2,730,000	\$1,623,400	Keller	
6 BMPs for Agriculture	TS05	Hendricks	NRCS	1997	2007	\$32,050,000	\$6,000,000	smola	
7 Technical Assistance to Seminole and Miccosukee Indian Reservations	TS24	Smola	NRCS	1998	2009	\$3,850,000	\$100,000	smola	
8 Technical Assistance to EAA and C-139 Basin	GL36	Boyd	NRCS	1995	2005	\$17,498,000	\$3,000,000	smola	
9 Monitoring of Organic Soils in the Everglades	GL37	Hendricks	NRCS	1997	2011	\$1,236,400	\$36,400	smola	
10 Urban Mobile Irrigation Lab	GL57	Smith	NRCS	1997	2011	\$2,500,000	\$130,000	smola	
11 Seminole Tribe Data Collection and Monitoring	TS85	Tepper	Seminoles	1997	2010	\$6,715,000	\$1,142,000	Tepper	
12 Supplemental Water Quality Treatment Technology Demonstration Projects	TS23	Gray	SFWMD	1997	2001	\$10,000,000	\$4,277,425	Joan	
13 Buck Island Agroecology Study	GL04	Steinman	SFWMD	1991	2010	\$12,000,000	\$7,000,000	Joan	
14 Lake Okeechobee Torpedo Grass Research	GL68	Hanlon	SFWMD	2000	2001	\$150,000	\$120,000	Joan	
15 Nutrient Threshold/dosing	CE15	Fontaine	SFWMD	1994	2001	\$13,000,000	\$10,000,000	Joan	
16 Everglades Landscape and Everglades Water Quality Model Development	CE29	Fontaine	SFWMD	1994	2001	\$3,500,000	\$2,400,000	Joan	
17 Aerial Photogrammetric Topography Database	Various	Ehmke	SFWMD	1983	Cont.	\$1,200,000	\$200,000	Various	
18 BCB Inland Water Quality Monitoring Program	C-12250	Tears	SFWMD/Collier County	1980	Cont.	\$250,000	\$60,000	Smith	
19 BCB Integrated Modeling of Surface and Ground Water Flow	C-11767	Nath	SFWMD/DHI	2000	2001	\$160,000	\$160,000	Christerson	
20 BCB Estuarine Water Quality Monitoring Program	C-10244	Weaver	SFWMD/RIU	1997	Cont.	\$500,000	\$75,000	Boyer	
21 BCB Regional Research & Monitoring Database	C-13257	Nath	SFWMD/FMRI	1997	Cont.	\$28,500	\$16,500	Truby	
22 Exotic Pest Plant Controls in South Florida Ecosystems	TS11	Center	USDA/ARS	1998	2006	\$10,317,000	\$1,190,000	Glaz	
23 Biological Control and Ecology of Invasive Pest Plants	TS50	Center	USDA/ARS	1997	2006	\$10,791,000	\$2,761,000	Glaz	
24 Agricultural Contribution to Carbon Cycling	GL22	Allen	USDA/ARS	1996	2001	\$1,797,980	\$719,192	Glaz	

Appendix E
Integrated Science Plan

Program/Project List

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SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE SCIENCE PROGRAM / PROJECT LIST CONTINUED

PROGRAMS									
Title	Project ID No.	PPM	Organization	Start	End	Financial Requirement	Appropriated to Date	Lead	
25 Sustainable Agriculture in the Everglades Agricultural Area	GL39	Miller	USDA/ARS	1998	2018	\$20,000,000	\$500,000	Glaz	
26 Development of Diverse Sugarcane Germplasm and its use in Development of Improved Varieties	GL40	Miller	USDA/ARS	1990	2010	\$29,250,000	\$7,785,000	Glaz	
27 Environmentally Friendly Forage-Livestock Systems for the Subtropical U.S.A.		M.J. Williams	USDA/ARS	2002	2006	\$1,000,000	\$250,000	Williams	
28 Managing Microbial Processes of Soil Subsidence in Histosols for Sustainable Sugarcane Yields		Morris	USDA/ARS	2000	2004	\$1,000,000	\$500,000	Morris	
29 Nutrient, Water and Pesticide Management for Horticultural Production and Water Quality Protection		Albano	USDA/ARS	2000	2004	\$1,000,000	\$500,000	Albano	
30 Best Management Practices to Protect Ground and Surface water from Agricultural Chemicals in the South Dade Basin		Potter	USDA/ARS	1999	2003	\$1,000,000	\$750,000	Potter	
31 Water Management Evaluation in Regions with High Water Table		Savabi	USDA/ARS	2000	2004	\$2,400,000	\$1,040,000	Savabi	
32 ATLSS Ecological Models & Model Enhancements	TS40	DeAngelis	USGS	1995	2005	\$13,345,000	\$5,195,000	Best	
33 Hydrological (SICS, TIME) Models & Model Enhancements	TS41	Schaffranek	USGS	1995	2005	\$21,485,000	\$11,183,000	Best	
34 South Florida Information Access System (SOFIA)	TS42	Sonenshein	USGS	1995	2005	\$9,501,000	\$4,887,000	Best	
35 High Density Topographic Surveys and Mapping	TS44	Desmond / Jones	USGS	1997	2005	\$10,325,000	\$2,910,000	Best	
36 Ecosystem History	TS44	Wardlaw/Wingard	USGS	1995	2003	\$5,597,000	\$3,941,000	Best	
37 Biogeochemical (Mercury) and Nutrient Process Studies	TS67	Krabbenhof / Orem	USGS	1995	2005	\$9,038,000	\$5,316,000	Best	
38 Florida Bay Geochemistry, Salinity, Sedimentation		Yates / Halley	USGS	1995	2005	\$3,000,000	\$1,750,000	Best	
39 Freshwater Flow Monitoring		Patino / Hittle	USGS	1995	2005	\$5,000,000	\$2,300,000	Best	
40 Native Lands - Internal Surface-Water Flows		Murray	USGS	1995	2004	\$300,000	\$250,000	Best	
41 Resources (American alligator data, aquatic community structure, estuarine communities, fire regimes, avian ecology, landscape ecology, mangroves, land-margin ecosystems)		Lofus/McIvor/Rice	USGS	1995	2005	\$29,253,000	\$12,491,000	Best	

PROJECTS									
Title	Project ID No.	PPM	Organization	Start	End	Financial Requirement	Appropriated to Date	Lead	
1 Limitations of Environmental Stresses and Physiological Responses on Crop Productivity	TS43	Sinclair	USDA/ARS	1995	2000	\$250,000	\$70,000	smola	
2 Florida Keys Nutrient Feasibility Study	FK15	Teague	EPA	1996	1998	\$566,000	\$566,000	Rogers	
3 Subsurface Sand Body Investigation (Sunniland)	SW22	Scott	FDEP	1996	1997	\$10,000	\$10,000	Outland	
4 Southwest Surficial Aquifer System Investigation	SW23	Scott	FDEP	1997	1998	\$60,000	\$60,000	Outland	
5 Florida Bay Fisheries - Habitat Assessment Program	CE40	Robblee	FLDEP	1997	2000	\$480,000	\$218,000	Outland	
6 Tree Island Restoration Everglades Mgt Area	CE27	Anderson	GFWFC	1997	2003	\$253,000	\$108,000	Poole	
7 Stock Structure and Abundance of Bottlenose Dolphins along Florida's West Coast	GL59	Goodyear	NMFS	1990	2001	\$380,700	\$156,000	Thompson	
8 Fish Abnormalities as Environmental Quality Indicators in the St. Lucie - Lower Indian River	GL60	Browder	NMFS	1999	2004	\$134,200	\$29,200	Thompson	
9 Seagrass Studies in Indian River Lagoon	GL62	Kenworthy	NMFS	1987	2001	\$573,000	\$393,000	Thompson	
10 Team Ocean	FK42	Tagliarini	NOAA	1997	2002	\$680,000	\$71,875	Keller	

SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE SCIENCE PROGRAM / PROJECT LIST CONTINUED

PROJECTS									
Project ID No.	Title	PPM	Organization	Start	End	Financial Requirement	Appropriated to Date	Lead	
11	Coral Reef Classroom	Kelly	NOAA	1997	2002	\$110,320	\$35,515	Keller	
12	Seminole Tribe Development of Water Quality Standards	Tepper	Seminoles	1995	2000	\$108,000	\$97,000	Tepper	
13	Assimilative Capacity for Phosphorus of C&SF Canals on the Big Cypress Reservation	Tepper	Seminoles	1997	2004	\$450,000	\$200,000	Tepper	
14	Forested Wetland Nutrient Uptake Research	Tepper	Seminoles	1998	2004	\$420,000	\$200,000	Tepper	
15	Everglades Tree Island Research and Monitoring Initiative: Phase I	Sklar, Heisler	SFWMD	1997	1999	\$169,751	\$83,900	Joan	
16	BCB ASR Feasibility Study in Collier County	Vidzes	SFWMD	1986	1987	\$150,000	\$150,000	CH2Mhill	
17	BCB Surface Water Reservoir Feasibility Study	Tears	SFWMD	1996	1996	\$7,000	\$7,000	Wilson/Miller	
18	BCB Ecologic Assessment	Nath	SFWMD	1997	1999	\$150,000	\$150,000	Greiner	
19	Status of Sheet Flow in BCB	Feng	SFWMD/BCNP	2001	2002	\$16,500	\$16,500	Sobczak	
20	Oysters as Indicators of Ecosystem Health	Ahmed	SFWMD/FGCU	2000	2002	\$18,750	\$18,750	Savarese	
21	Wildlife Survey in SGGE	Nath	SFWMD/DOF	2000	2002	\$63,000	\$23,000	Durrwachter	
22	Spatial Modelling of Freshwater Flow into Estuarine Habitats	Nath	SFWMD/FMRI	2002	2003	\$100,000	\$50,000	Rubec	
23	Relationships between Inshore Populations of the Pink Shrimp, Penaeus duorarum, and Offshore Tortugas and Sanibel Fisheries	Robblee	USGS	1997	1999	\$150,000	\$75,000	Best	
24	Fish recruitment, Growth and Habitat Use in Florida; An Integrated Team Approach	Robblee	USGS	1997	1998	\$825,000	\$275,000	Best	
25	Population genetic structure and the dispersal of freshwater fishes and prawns	Loftus	USGS	1996	2000	\$130,000	\$10,000	Best	
26	Freshwater mesocosm Studies	Loftus	USGS	1996	2002	\$187,000	\$82,000	Best	
27	Life History and Ecology of the Everglades Crawfish	Loftus	USGS	1996	2000	\$250,000	\$85,000	Best	
28	Population Structure and Spatial Delineation of Aquatic Consumer Communities in the Everglades National Park	Loftus	USGS	1996	2001	\$204,100	\$200,000	Best	
29	Plant Biodiversity of Big Cypress National Preserve	Snyder	USGS	1998	2000	\$48,000	\$48,000	Best	
30	Hydrologic Reconnaissance of the gray limestone aquifer of South Florida	Reese	USGS	1996	1999	\$817,000	\$323,600	Best	
31	Ground-Water Discharge to Biscayne Bay	Langwin	USGS	1997	2003	\$1,400,000	\$350,000	Best	
32	Stratigraphy and hydrogeology of the surficial aquifer system of Southwest Florida	Wardlaw	USGS	1996	1999	\$939,177	\$635,050	Best	

Appendix E
Integrated Science Plan

Program/Project List

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SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE SCIENCE PROGRAM / PROJECT LIST CONTINUED

UNDERFUNDED PROGRAMS/PROJECTS

Project ID No.	Title	PPM	Organization	Start	End	Financial Requirement	Appropriated to Date	Lead
1	Agriculture Land Stewardship	Smola	NRCS	1997	2008	\$10,920,000	\$0	smola
2	Fire Management Plans for Public Lands	Folks	FDACS	1998	2003	\$2,600,000	\$0	Folks
3	Ecosystem History; Studies of Land Use and Ecological Change	Patterson	FDEP	1998	2004	\$1,062,000	\$0	Outland
4	Assessment of Endocrine-Disrupting Contaminants in the Florida Everglades	Axelrad	FDEP	1999	2002	\$644,000	\$0	Outland
5	Natural System Boundary Alternatives and Natural Lands Information System	Haddad	FDEP	1998	2000	\$310,000	\$0	Outland
6	Identification and Documentation of Ecosystem Reference Areas as a Biodiversity Monitoring Framework	Minasian	FDEP	1999	2000	\$200,000	\$0	Outland
7	Six Water Level Meteorological Stations	Harrrell	FDEP	1998	2003	\$1,349,500	\$0	Outland
8	Subregional characterization of the geological framework of the subsurface coarse sand zone and its influence on Florida Bay and the southern Florida ecosystem	Scott	FDEP	1999	2001	\$300,000	\$0	Outland
9	Characterization of the geologic framework of the subsurface coarse sand zone and its influence on Florida Bay	Scott	FDEP	1997	2000	\$1,500,000	\$0	Outland
10	Establishing BMPs for Agricultural and Urban Areas of the Eastern C-111 Basin	Klassen	IFAS	1997	2002	\$17,690,000	\$0	call
11	A Program to Reduce Phosphorus, Nitrogen and Pesticide Runoff and Leaching from Turf/Grass into South Florida Surface and Ground Waters	Snyder	IFAS	1997	2000	\$280,000	\$0	call
12	Pollution Prevention	Smola	NRCS	1999	2003	\$870,000	\$0	Smola
13	Soil Survey Update for the Everglades Agricultural Area	Hendricks	NRCS	1997	2000	\$1,500,000	\$0	smola
14	Soil Survey for Everglades National Park & Water Conservation Areas	Hendricks	NRCS	1997	2002	\$4,280,000	\$0	smola
15	Impacts of Sludge Deposition on Phosphorus Levels on the Big Cypress Reservation	Tepper	Seminoles	1998	1998	\$30,000	\$0	Tepper
16	Seminole Tribe Ecotoxicology Study	Tepper	Seminoles	2000	2020	\$221,000	\$0	Tepper
17	Southwest Florida Water Management Model and Natural System Model	Merrittam	USFWS	2000	2005	\$2,000,000	\$0	Grahl
18	Role of Aquatic Refuges in the ecology of wetland fishes	Loftus	USGS	1998	2001	\$150,000	\$0	Best
19	Experimental Studies of Population Growth and Predator-Prey Interactions of fishes in the Everglades National Park	Loftus	USGS	1998	2001	\$75,100	\$0	Best
20	Hydrologic Variation and Ecological Processes in the Mangrove Forest of South Florida	Smith	USGS	1996	1999	\$100,880	\$0	Best
21	Strand Structure and Productivity of Short-hydroperiod Graminoid Wetlands	Snyder	USGS	1999	2002	\$470,000	\$0	Best
22	Aquatic Animal Dynamics in Big Cypress Habitats	Loftus	USGS	1999	2004	\$800,000	\$0	Best

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