Chapter 7: District Water Management Plan 2004 Annual Report

Beth Williams

INTRODUCTION

Water resource issues are major forces shaping the future of the region; and so, while the South Florida Water Management District (SFWMD or District) has a long, proud history of providing vital water management and protection of the ecosystems of central and southern Florida, the agency's success depends upon its ability to plan and prepare for the future. This agency is undertaking water resource management efforts of global significance and establishing itself as the world's premier water resource agency.

Following a comprehensive examination of water resource management in the 16-county South Florida region in August 2000, the Governing Board of the District in August 2000 approved the District Water Management Plan (DWMP). The DWMP is a direction-setting document and a communication tool. The DWMP, along with the District's Strategic Plan and annual budget cycle, enables the agency to meet its goals and to position itself to design, build, operate, and maintain the diverse projects and processes needed to attain the identified objectives.

The policies, programs, projects, and processes of the District described in the DWMP reflect the multifunctional nature of water resource management in the region. The interrelated nature of the District's four areas of responsibility – water supply, flood protection and floodplain management, water quality, and natural systems – was considered in the development of the DWMP. The effects of projects and processes identified in one area of responsibility on the others continue to be considered in the implementation of the DWMP.

The District Water Management Plan was developed consistent with the requirements of Section 373.036, Florida Statutes (F.S.), and Section 62-40.520, Florida Administrative Code (F.A.C.). The Florida Department of Environmental Protection (FDEP), in conjunction with the five water management districts, developed additional criteria for the DWMP.

The DWMP provides comprehensive long-range guidance for the actions of the District in implementing its responsibilities under state and federal laws. The DWMP is scheduled to be updated every five years at minimum. The District plans to release an updated long-term planning document in May 2005, which will showcase the District's current programs defined in the Strategic Plan, and will highlight the precedent-setting initiatives that are under way to protect and restore natural systems and to increase available water supplies.

Given the long-range nature of the DWMP, it is important to evaluate the progress of the District toward accomplishing its goals and objectives. The necessity for the regular review and evaluation of progress in achieving planning goals is explicitly recognized in the State Water Resource Implementation Rule, which requires regular review of the DWMP pursuant to Chapter 62-40.520, F.A.C. The District is required to report annually to the FDEP regarding its progress

in implementing the DWMP. Accordingly, this DWMP Annual Report serves as a status report on the activities undertaken by the District, as well as on the performance measures contained in the DWMP between updates.

In an effort to facilitate comparison of the plans of each of the water management districts, the DWMP was organized to reflect the areas of responsibility of the water management districts. This common format is also used for the annual report to help track the progress the District has made in implementing its DWMP. This annual report covers progress made by the District during Fiscal Year 2004 (FY2004) in implementing its projects and processes, particularly those described in the 2000 update of the DWMP. The District's fiscal year is from October 1, 2003 through September 30, 2004.

FISCAL YEAR 2004 SUMMARY

In 2004, the District developed and approved a Strategic Plan for carrying out long-term agency programs and priorities. In turn, the District developed an annual work plan that incorporates specific deliverables, milestones, and success measures for projects and initiatives to be accomplished. Quarterly reporting on the major projects identified in the work plan will begin in FY2005.

The District's approved budget now is linked directly to the work plan and includes funding to move forward with seven key strategic priorities:

- Build three reservoirs through public/private partnerships
- Achieve Everglades water quality standards
- Acquire land for Kissimmee River restoration
- Reduce phosphorus inputs to Lake Okeechobee
- Refurbish the regional water management system
- Implement Water Supply Plan recommendations
- Continue to recognize the value of employees

The District established an ambitious schedule of activities in its 2000 update of the DWMP. This schedule called for projects and processes in each of the areas of responsibility in the years following the DWMP's acceptance. During FY2004, the District largely adhered to the schedule of activities described in the DWMP.

In previous annual reports the progress the District had made on the projects and processes described in the DWMP, along with significant accomplishments for the past fiscal year, was organized and reported by the areas of responsibility. For FY2004, this information has been consolidated within the Consolidated Project Report Database [see Appendix 1-3 of the *2005 South Florida Environmental Report – Volume II* (2005 SFER)]. An overview of the District's goals and objectives in the DWMP, as well as some recent accomplishments, is provided below.

WATER SUPPLY

The State of Florida has statutory goals for water supply, which are contained in the State Comprehensive Plan and the Water Resources Act of 1972. The state's goals, which comprise the foundation of the District's water supply goals, are found in the State Comprehensive Plan, Chapter 187, F.S.; the Water Resources Act of 1972, Chapter 373, F.S.; Chapter 163, F.S.; Sections 187.201(8)(a), F.S., 373.039, F.S., 403.064, F.S., and 373.205 F.S.; and the District's Water Supply Policy document of 1991. To accomplish these requirements, the 2000 DWMP identified the District's water supply goals as follows:

- Assure an adequate supply of water for all existing and projected reasonable and beneficial uses
- Increase available water supply
- Promote the use of alternative water supply sources and conservation
- Protect the water quality of source water from degradation and natural systems from significant harm which could result from water use

The water supply portion of the DWMP addresses two core water supply objectives, which are discussed further in the Performance Measures section of this chapter:

- **Core Objective WS 1:** Increase available water supplies and maximize overall water use efficiency to meet identified existing and future needs
- **Core Objective WS 2:** Prevent contamination of water supply sources

The District's water supply priorities include constructing water resource projects and increasing support for Alternative Water Supply (AWS) projects and water conservation. Minimum Flows and Levels (MFLs) and water reservations for natural systems, both required by statute, ensure the sustainability of water resources. Water use permitting is a powerful tool by which the District regulates ground and surface water withdrawals by major users.

The District is partnering with the federal government to implement the Comprehensive Everglades Restoration Plan (CERP), which is the largest ecosystem restoration project in the world. The restoration plan is focused largely on increasing water storage and improving the timing, quality, and distribution of water deliveries to the ecosystem. The goal of this work is to restore, preserve, and protect South Florida's ecosystem while providing for other water-related needs of the region, including water supply and flood protection.

Increased water storage and improved water quality are the backbone of Everglades restoration, and so during FY2004 the District committed to building three reservoirs by 2009 to complete a major part of the restoration plan five years ahead of schedule. The District also laid the groundwork so that in the first quarter of FY2005, it can step up the pace to restore America's Everglades by advancing the funding, design, and construction of eight projects. This accelerated program will achieve 70 percent of the restoration's goals, which will allow the agency to complete these projects sooner – by 2010, versus the current scheduled completion in 2015 – while maintaining the momentum of CERP. For more information on CERP projects, the reader is referred to Chapter 2, CERP Annual Report, or to the official CERP Website, at http://www.evergladesplan.org.

The District's water supply program exists to ensure an adequate supply of water to protect and enhance natural systems, and to meet all existing reasonable and beneficial uses while

sustaining water resources for future generations. The goals of this program's regulatory functions are to: provide fair, consistent, and timely review of permit applications in accordance with the adopted rules and criteria of the District; ensure compliance with issued permits; and take enforcement action where necessary.

A significant water supply accomplishment for FY2004 was the completion of the Upper East Coast Regional Water Supply Plan update. The Kissimmee Basin, Lower East Coast, and Lower West Coast Water Supply plan updates also were initiated during FY2004. Implementation of the updated recommendations in the Upper East Coast plan will commence in FY2005. All plans are scheduled to be completed by FY2006. For additional information on water supply projects, the reader is referred to Chapter 4 of the 2005 SFER – Volume II, which contains the Five-Year Water Resource Development Work Program, and Chapter 5, which is the Alternative Water Supply Annual Report.

FLOOD PROTECTION AND FLOODPLAIN MANAGEMENT GOALS

The State Comprehensive Plan includes flood protection and floodplain management goals. The state's flood protection and floodplain management goals are found in Sections 187.201(7)(b)25 and 187.201(8)(b)8, F.S. In order to achieve these goals, the 2000 DWMP identified the following flood protection and floodplain management goals:

- Protect from and mitigate the impacts of flood events
- Protect and restore natural features of floodplains

Historically, flood protection has been at the core of the District's function, since the agency was established in 1949 as the Central and Southern Florida Flood Control District. The flood protection and floodplain management portion of the DWMP is divided into two core objectives:

- **Core Objective FP 1:** Minimize damage from flooding
- **Core Objective FP 2:** Promote nonstructural approaches to achieve flood protection and to protect and restore the natural features and functions of the 100-year floodplain

South Florida receives 53 inches of rain in an average year, much of it during the summer months. Flood protection operation activities include the operation and maintenance of 500 water control structures and 50 pump stations and managing 1,969 miles of canals and levees to move 19 million acre-feet (ac-ft) of water annually.

During the summer of 2004, the District's flood protection and emergency management operations were spotlighted during a quick succession of major storm events. Of note were Hurricanes Charley, Frances, Jeanne, and Ivan. *The Washington Post* on September 9, 2004, published a front-page story, headlined "This Time, Man Defeated Nature: Florida's Flood-Control System Kept Frances from Swamping Plains." The District is very pleased with the exceptional performance of the system — after extraordinarily heavy rains, there was little flooding throughout South Florida.

The historic S-310 navigational lock, which penetrates the Herbert Hoover Dike at Clewiston, was taken out of service for extensive repairs and rehabilitation on June 8, and placed back into service on August 27, 2004. The S-310, which was originally constructed in 1933 as a hurricane gate, was modified into a navigation lock in 1981, and allows boat passage between Lake

Okeechobee and the Industrial Canal. The structure had not received a major overhaul or anything other than routine repairs in the 23 years since its creation.

During FY2004, as is done every year, the 10- and 50-year plans were updated and further implemented to utilize life-cycle costing for equipment and facilities, refurbish the infrastructure to its design condition, and operate and maintain the regional system under established schedules. The goal of the District's Operations and Maintenance Program is to minimize damage from flooding, provide adequate regional water supply, and protect and restore the environment by optimally operating and maintaining the primary flood control and water supply system. The agency's Five-Year Capital Improvements Plan, Chapter 9 of this volume, contains information about major capital projects that support the regional system.

WATER QUALITY GOALS

The State of Florida has stated water quality policy and goals, which are found in Chapter 187, F.S., and Sections 403.021(2) and 187.201(8)(a), F.S. The DWMP has the following related water quality goals:

- Protect and improve surface water quality
- Protect and improve groundwater quality

The water quality section of the DWMP addresses efforts to ensure that water quality standards are met throughout the District, and utilizes two core objectives:

- **Core Objective WQ 1:** Protect and improve surface water quality
- **Core Objective WQ 2:** Protect and improve groundwater quality

The District's water quality priorities include achieving water quality standards for the Everglades and reducing phosphorus inputs to Lake Okeechobee.

The District's Everglades Program is focused on responsibilities outlined in the Everglades Forever Act (EFA). The Everglades Construction Project (ECP) resulted from this act, which was passed by the Florida Legislature in 1994. During the 2003 legislative session, the act was amended to include the Conceptual Plan for Achieving Long-Term Water Quality Goals for the Everglades Protection Area (EPA). Additional information regarding the Long-Term Plan is found in Chapter 8 of the 2005 SFER – Volume I. The District's goal for this program is to contribute to restoration of the Everglades by restoring water quality and hydrology and improving planning and operational decisions through applied science.

The District has made substantial progress toward reducing phosphorus levels discharged into the EPA. The combined performance of the regulatory program in the Everglades Agricultural Area (EAA) and the Stormwater Treatment Areas of the Everglades Construction Project, both mandated by the EFA, has exceeded expectations. Chapters 3 and 4 of the 2005 SFER – Volume I present, respectively, Phosphorus Controls for the Basins Tributary to the Everglades Protection Area and STA Performance, Compliance and Optimization.

Some source control measures have been implemented in urban and other tributary basins included in the Everglades Stormwater Program. Nonetheless, additional measures are necessary to ensure that all discharges to the EPA meet water quality standards and the goals established in the EFA, including compliance with the phosphorus criterion established in Rule 62-302.540, F.A.C. The reader is referred to Chapter 2A of the 2005 SFER – Volume I for a report on the

Status of Water Quality in the Everglades Protection Area. The Long-Term Plan was developed to achieve compliance with the phosphorus criterion. This plan is predicated upon maximizing water quality improvement through an adaptive implementation process. The Everglades Forever Act Annual Financial Report is presented in Chapter 6 of the 2005 SFER – Volume II.

Thanks to a response in December 2003 by the agricultural community and the Seminole Indian Tribe of Florida, the District had the opportunity to potentially divert and store up to 100,000 ac-ft of Lake Tohopekaliga environmental drawdown water on private and state-owned land. The drawdown of this lake in central Florida from 55 feet to 49 feet was crucial for avoiding additional environmental degradation to the lake. The physical removal of organic muck and nuisance vegetation will significantly improve fish and wildlife habitat. The voluntary overture by the farmers and tribe to store the water on their land significantly reduced potential impacts on Lake Okeechobee and the coastal estuaries.

The goal of the District's Lake Okeechobee Program is to improve the health of the Lake Okeechobee ecosystem by improving water quality, reducing, or eliminating exotic species, and better managing water levels. This program will reduce phosphorus inputs to the lake, which is the "liquid heart" of South Florida's interconnected aquatic ecosystem. For more information, see Chapter 3 of the 2005 SFER – Volume II, which is the Lake Okeechobee Annual Report.

The District, in cooperation with the FDEP and other agencies and stakeholders, completed the Lake Okeechobee Protection Plan (LOPP) in January 2004. The Lake Okeechobee Protection Program includes water quality improvement projects to reduce phosphorus in stormwater runoff. The goal of this program is to improve the health of the lake ecosystem by improving water quality, reducing or eliminating exotic species, and better managing water levels. Details on the Lake Okeechobee Protection Program are presented in Chapter 10 of the 2005 SFER – Volume I.

In a victory for the Everglades restoration process, the U.S. Supreme Court on March 24, 2004 ruled in favor of the District in overturning a lower court's decision that would have forced water managers across the country to change their operational procedures. The Supreme Court vacated the 11th Circuit Court of Appeals' decision, and is sending the case back to the lower court, where it will be heard by the end of the year. An adverse ruling not only would have added barriers to environmental protection of the Everglades, but would have substantially increased the regulatory burden and cost for public water management agencies across the country.

The District is rarely exempt from obtaining permits for the construction and operation of its works and projects, and must adhere to the terms and conditions of those permits or be subject to enforcement action and penalties. The District complies with a multitude of permit-required monitoring and assessment work for biological, hydraulic, hydrologic, hydrogeologic, and water quality parameters. With the creation of CERP projects and their individual monitoring plans, and with the construction of other capital and federal/state projects, the amount of permit-required monitoring is increasing measurably**.**

NATURAL SYSTEMS GOALS

The Florida Legislature has outlined the state's natural system goals in Sections 187.201(10)(b)1, F.S., 187.201(8)(b)14, F.S., 370.025(1), F.S., and 94-356, 2(c) Laws of Florida. In order to preserve, enhance, and restore the water resource-related natural systems within its boundaries, the DWMP committed to the following natural system goals:

- Preserve native ecosystems, along with their water resource-related functions
- Restore altered ecosystems, where appropriate, along with their water resource-related functions

The importance of natural systems management at the District has increased over the years as a result of greater awareness of environmental issues. Land planning and environmental resource protection legislation enacted by the State of Florida over the past 30 years has obligated the District to place greater emphasis on regional ecosystem management. The District has two core natural systems objectives:

- **Core Objective NS 1:** Maintain the integrity and functions of water resources and related natural systems
- **Core Objective NS 2:** Restore degraded water resources and related natural systems to a naturally functioning condition

Strategies by which the District will implement these natural systems objectives include building reservoirs and constructing water control facilities, acquiring lands, monitoring environmental responses, and practicing adaptive management.

The District has been working to create a restoration plan for the Loxahatchee River. A minimum flow of 35 cubic feet (262 gallons) per second over the Lainhart Dam in Jupiter was mandated in 2003 by the District's Governing Board. The District committed to guarantee an even greater volume of water that will help restore the river — the first water reservation ever created by the District.

The District is partnered with the federal government to restore the ecological integrity of the Kissimmee River and floodplain ecosystem. Water quality, water supply, natural resources, and flood control level of service in the Kissimmee Upper Basin will be improved. The headwater and river system will be regulated to balance impacts to the upper and lower basin.

Birds are making a significant comeback in the 15-mile stretch of the Kissimmee River that the District and the U.S. Army Corps of Engineers (USACE) restored in the first phase of the historic restoration project. Since completion of Phase I, eight species of shorebirds that disappeared following channelization have reappeared in the restored area. Further, counts during the 2003 wet season revealed that the number of wading birds per square mile of restored floodplain had nearly quadrupled since completion of Phase I. Additional information on the Kissimmee River Restoration and Upper Basin Initiatives is presented in Chapter 11 of the 2005 SFER – Volume I.

PROJECTS AND PROCESSES

Each District project or process that was planned or under way at the time the DWMP was developed was described within the area of responsibility that was its primary function. In both philosophy and practice, however, the District recognized the multifunctional, multidisciplinary nature of water management in South Florida. The four areas of responsibility are highly interrelated, and so the complex interactions were carefully considered within each activity or project. Accordingly, projects or processes may have a focus in one area of responsibility but have implications in multiple areas.

The FY2004 status of each DWMP project or process is described in the Consolidated Project Report Database (see Appendix 1-3 of this volume) if it is denoted with a ✓ in the first column of the following table. The database contains a wealth of information, including project objective, purpose, related projects and reports, resource and performance measures, and other details. The DWMP core objectives for each project or process are denoted in the table with a ■. Projects completed prior to FY2004, or those that have been discontinued, deleted, or merged with other projects, are not described in the database, and are noted accordingly with N/A under the Project Description column and given a reason under Comments. Many of these projects, such as Alternative Water Supply, CERP, and Capital Improvements projects, are further detailed in other chapters of this volume.

Project Description	District Water Management Plan Project or Process	Core Objective								Comments
		WS		FP		WQ		NS		
		1	2	1	2	1	2	1	2	
✓	404 Permit Research, Monitoring and Modeling – Receiving Waters					■				
✓	Additional S-345 Structures								■	
✓	Alternative Water Supply Cooperative Projects	■								
✓	Basin Flood Studies			■						
✓	Big Cypress Basin Watershed Management Plan			■				■		
✓	Biscayne Bay SWIM Plan Update								■	
✓	Broward County Secondary Canal System	■								
N/A	C-4 Water Control Structure Critical Project								■	Complete
✓	C-111 Project Implementation			■					■	
✓	C-23, C-24 Regional Attenuation Stormwater Treatment Areas	■								
✓	Caloosahatchee River (C-43) Basin Aquifer Storage and Recovery Pilot Project	■								
✓	Caloosahatchee Water Management Plan	■								
✓	Canal / Levee Maintenance			■						
✓	Capital Program	■		■						
✓	Central and Southern Florida Project Operational Planning	■								
✓	Comprehensive Everglades Restoration Plan Reserves	■								
N/A	Comprehensive Integrated Water Quality Plan					■				Not a District project
✓	Eastern Hillsboro Aquifer Storage and Recovery Project	■								
✓	Electronics, Communications and Control Devices	■		■						
✓	Emergency Management			■						
✓	Environmental Operations Protocol							■		
✓	Environmental Resource Permitting			■	■			■		
✓	Equipment Maintenance	■		■						
✓	Establish Ecological and Hydrologic Needs for the Everglades Protection Area								■	
✓	Everglades Best Management Practices Effectiveness Research					■				
✓	Everglades Construction Project					■				
✓	Everglades Construction Project Research and Data Collection					■				
✓	Everglades Exotic Species Control								■	
✓	Everglades Food Web / Wading Birds Hydrologic Effect								■	
✓	Everglades Storm Water Program					■				
✓	Everglades Works of the District Permitting					■				
✓	Exotic Plant Control	■		■						
✓	Florida Bay and Florida Keys Feasibility Study					■				
✓	Florida Bay – Ecological Response to Restoration Activities								■	
✓	Florida Bay Minimum Flows and Levels							■		
✓	Florida Bay Research – Sea Grass Mortality and Algal Blooms								■	
✓	Florida Keys Tidal Restoration								■	
✓	Florida Keys Water Quality Plan					■				
N/A	Flood Control Level of Service			■						Discontinued
✓	Flows from Central Lake Belt Storage Area to Water Conservation Area 3B	■								
✓	G-404 Pump Station Modifications								■	
✓	General Land Acquisition				■			■		
✓	General Maintenance	■								
✓	Hillsboro Aquifer Storage and Recovery Pilot Project	■								

Project Description	District Water Management Plan Project or Process	Core Objective								Comments
		WS		FP		WQ		NS		
		1	2	1	2	1	2	1	2	
✓	Hydrologic Management – Hydrologic Studies	■								
✓	Hydrologic Modeling and Analysis – Water Resource Development	■								
✓	Hydrologic Monitoring								■	
✓	Indian River Lagoon Restoration Feasibility Study							■		
✓	Indian River Lagoon Seagrass Monitoring							■		
✓	Indian River Lagoon SWIM Plan Documentation					■				
✓	In-Lake Research on Water Level Impacts							■		
✓	Kissimmee Basin Data Collection and Evaluation					■				
✓	Kissimmee Basin Minimum Flows and Levels Development							■		
N/A	Kissimmee Basin Plan Development					■				Discontinued
✓	Kissimmee Basin Restoration and Assessment								■	
N/A	Kissimmee Basin Water Supply Plan Development and Coordination	■								Completed
✓	Kissimmee Basin Water Resource Development Implementation	■								
N/A	Kissimmee River Restoration Design								■	Combined with following project
✓	Kissimmee River Restoration Engineering Design and Implementation			■					■	
✓	Kissimmee River Restoration Land Acquisition								■	
✓	L-31 North Seepage Management Pilot Project	■								
✓	Lake Belt In-Ground Reservoir Technology Pilot Project	■								
N/A	Lake Istokpoga Regulation Schedule	■								Merged with another project
✓	Lake Okeechobee ASR Pilot Project						■			
✓	Lake Okeechobee Exotic Control								■	
✓	Lake Okeechobee Research and Data Collection					■		■	■	
✓	Lake Okeechobee SWIM Plan Implementation								■	
✓	Lake Okeechobee Tributary Sediment Dredging					■				
✓	Lake Okeechobee Water Retention / Phosphorus Removal					■				
✓	Lake Okeechobee Works of the District Permitting					■				
✓	Lake Trafford Restoration Critical Project								■	
✓	Lake Worth Lagoon Restoration								■	
✓	Local Liaison		■							
✓	Local Plan Review		■	■			■			
N/A	Lower East Coast Minimum Flows and Levels							■		Completed
N/A	Lower East Coast Water Supply Plan Development and Coordination	■								Completed
✓	Lower East Coast Water Supply Development Implementation	■								
✓	Lower West Coast Water Quality Monitoring					■				
✓	Lower West Coast Water Resource Development Implementation	■								
N/A	Lower West Coast Water Supply Plan Development and Coordination	■								Completed
✓	Miami-Dade County Aquifer Storage and Recovery	■								
✓	Modified Water Deliveries to Everglades National Park			■					■	
✓	Modify Holey Land Wildlife Management Area Operation Plan								■	
✓	Modify Rotenberger Wildlife Management Area Operation Plan								■	
✓	Monitoring and Evaluation (RECOVER)								■	
N/A	Northern Palm Beach County Comprehensive Water Resources Management Plan	■								Completed
✓	Operations and Maintenance of Everglades Construction Project					■				

Project Description	District Water Management Plan Project or Process	Core Objective								Comments
		WS		FP		WQ		NS		
		1	2	1	2	1	2	1	2	
N/A	Pineland and Hardwood Hammock Restoration (C-111 Basin)					■				Discontinued
✓	Rain-Driven Schedules for the Everglades							■	■	
✓	Recharge Mapping	■					■			
✓	Regulation Model Technology Development / Application							■		
✓	Revise Consumptive Use Permitting Rules	■								
✓	Right-of-Way Management			■						
✓	S-356 Structures (Miami-Dade County)								■	
N/A	Salinity Distribution and Flow Management Studies for Lake Worth Lagoon							■		Completed
✓	Southern Golden Gate Estates Hydrologic Restoration								■	
✓	Southern L-8 In-Ground Reservoir	■								
✓	South Lee County Watershed Plan			■						
N/A	South Miami-Dade County Integrated Water Resource Strategy							■		Discontinued
✓	Southwest Florida Feasibility Study							■		
✓	Stewardship Save Our Rivers Lands				■			■		
✓	STA / ENR Project Optimization, Research and Modeling								■	
✓	St. Lucie Estuary / Indian River Lagoon					■				
✓	Structure Operations	■		■						
✓	Taylor Creek / Nubbin Slough Reservoir and STA					■				
✓	Ten Mile Creek Critical Project	■								
✓	Upper East Coast Water Resource Development Implementation	■								
N/A	Upper East Coast Water Supply Plan Development and Coordination	■								Completed
✓	Water Conservation	■								
N/A	Water Conservation Area 3A and 3B Flows to Central Lake Belt Storage Area	■								Deleted
✓	Water Conservation Area 3A and 3B Seepage Management	■								
✓	Water Control Structure Maintenance	■		■						
✓	Water Preserve Area Feasibility Study						■			
✓	Water Quality Monitoring					■				
✓	Water Quality Monitoring – Florida Bay					■				
✓	Water Shortage Management		■				■			
✓	Water Supply Program Controls	■								
✓	Water Use Permitting	■	■				■			
✓	Wellhead Protection Programs		■				■			
✓	Western C-11 Water Quality Improvement Critical Project					■				
✓	Western Tamiami Trail Culverts Critical Project								■	
N/A	Wetland Criteria Development and Support		■				■	■		Completed
✓	Wetlands Mitigation – DuPuis Reserve							■		
✓	Wetlands Mitigation – K-Mart							■		
✓	Wetlands Mitigation – Pennsuco							■		
✓	Wetlands Mitigation – Shingle Creek							■		
✓	Wetlands Mitigation – Upper Lakes Basin							■		

PERFORMANCE MEASURE VALUES

Performance measures are used to track and report the District's accomplishments in terms of both outputs and outcomes. Outputs are the services delivered by the District. Outcomes are the effects of District actions on water resources. Annually, the District conducts an evaluation of its success in achieving the desired goals established in the DWMP. Such an evaluation requires a performance-based assessment of the effectiveness of the efforts undertaken by the agency in achieving its long-term purposes.

During the development of the DWMP, each water management district committed to incorporate a series of performance measures that will provide an indication of its success in achieving the goals described in its respective DWMP. In an effort to facilitate comparison of the five water management districts throughout the state, all of the districts agreed to use a single set of core performance measures. Additional measures specific to each district also were included at the discretion of each agency.

Different measures were agreed upon to assess the effect of activities within each area of responsibility. In some cases, a single measure may provide information in more than one area, and some measures are common to all areas. Accordingly, the District's performance measure reporting is organized into the following five sections:

- Performance Measures Common to All Areas of Responsibility
- Performance Measures for Water Supply
- Performance Measures for Flood Protection and Floodplain Management
- Performance Measures for Water Quality
- Performance Measures of Natural Systems Management

Core performance measures are those that all water management districts agreed to report in the DWMP. The District's unique geographic features lend themselves to additional measures that are specific to its region.

PERFORMANCE MEASURES COMMON TO ALL AREAS OF RESPONSIBILITY

Performance measures common to all areas of responsibility include land acquisition and management and permitting activities. The District's land acquisition activity for FY2004 culminated with the purchase of 12,935 acres of land for a total cost exceeding $100 million. The District protects the supply and the quality of water resources by regulating the management and storage of surface waters and the dredging or filling of wetlands with Environmental Resource Permits. The agency also regulates via Water Use or Consumptive Use Permits the ground and surface water withdrawals of major users such as water utilities, agriculture and nurseries, golf courses, mining, and other industrial users.

There are five performance measures common to all areas of responsibility:

- CM (a): Acres in managed conservation areas acquired by the District

- CM (b): For District-owned lands: (1) number of management plans required, (2) number of management plans completed, and (3) percentage of management plans completed on schedule
- CM (c): Number and percent of land management plan activities being implemented according to plan schedules
- CM (d): Acres of land acquired through less-than-fee ownership on an annual and cumulative basis
- CM (e): Percentage of Environmental Resource Permitting (ERP) for which compliance inspections were conducted and of those inspected, percentage found to be in compliance

These performance measures and their FY2004 values are discussed further below. The District points of contact for each also are provided.

Core Performance Measure CM (a): Acres in managed conservation areas acquired by the District

[Fred Davis/Bill Helfferich]

The District acquired 3,605 acres of conservation lands in FY2004, bringing the total conservation lands managed by the District to 308,205 acres. This includes only natural areas. Lands purchased for water resource projects, such as Stormwater Treatment Areas, the East Coast Buffer, and other projects, are not included.

Core Performance Measure CM (b): For District-owned lands: (1) number of management plans required, (2) number of management plans completed, and (3) percentage of management plans completed on schedule

[Fred Davis/Bill Helfferich]

Nearly half of the District-owned Save Our Rivers (SOR) lands are managed by other agencies; preparation of management plans is the responsibility of those agencies. The District directly manages 170,093 acres in 11 different projects. Each project requires a management plan with an update every five years. Eight management plans have been completed.

Most SOR projects contain multiple parcels that may be acquired over a period of years before enough contiguous tracts are aligned to warrant a management plan. The District does not, therefore, develop specific timelines for management plan preparation. Furthermore, some projects are being considered as wildlife and environmental areas, and will be under Florida Fish and Wildlife Conservation Commission (FWC) management. Prior to opening these areas to hunting, wildlife inventories must be prepared, which can delay the development of management plans.

Additional information and project maps of SOR projects can be obtained from the Save Our Rivers Land Acquisition & Management Plan, available at www.sfwmd.gov/org/clm/lsd/3_lamp00.html.

Core Performance Measure CM (c): Number and percent of land management plan activities being implemented according to plan schedules

[Fred Davis/Bill Helfferich]

In FY2004, the District was the lead manager on 11 land management projects, which included developing or updating management plans for DuPuis, Allapattah Flats, and Cypress

Creek. Five-year management plans must be developed and updated for each project. Projects that need management plans in FY2005 are Lake Marion/Upper Reedy Creek, Shingle Creek, and Model Lands.

Management activities that must be implemented for all projects include prescribed burning, exotic plant treatment, resource protection (security), public use, and natural and cultural resource inventories. The five-year management plans do not contain schedules for these management activities. Instead, annual work plans specify the activities that will be undertaken in each management area during each fiscal year.

Burning, exotic plant control, resource protection, and public use are ongoing actions that are repeated annually. Inventories are prepared after sizable tracts have been acquired and are updated only to document a restoration activity or significant disturbance. **Table 7-1** indicates management activities that were implemented for each project during FY2004.

Table 7-1. Land management activities implemented during Fiscal Year 2004 (FY2004).

Project Name	Prescribed Burning	Exotic Plant Treatment	Resource Protection	Public Use	Resource Inventories
Allapattah Flats	■	■	■		■
CREW	■	■	■	■	■
Cypress Creek/Loxahatchee	■	■	■		
DuPuis	■	■	■	■	■
Kissimmee Chain of Lakes	■	■	■	■	■
Kissimmee River	■	■	■	■	■
Lake Marion Creek	■	■	■	■	■
Loxahatchee Slough	■	■	■		
Model Lands	■	■	■		
Reedy Creek	■	■	■	■	■

Core Performance Measure CM (d): Acres of land acquired through less-than-fee ownership on an annual and cumulative basis

[Fred Davis/Bill Helfferich]

The District has acquired 14,952 acres in less-than-fee ownership since implementation of the SOR Program in 1981. **Table 7-2** indicates the acreage acquired by year.

Table 7-2. Less-than-fee acreage acquired since implementation of Save Our Rivers (SOR) Program from 1980–2004.

Time Span	Year										Total Acres
1980s	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**7,428**
	(Acres per Year Summarized for Pre-1990 Acquisitions)										
1990s	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**7,330**
	1,253	1,214	0	1,868	415	99	1,655	649	144	33	
2000s	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**194**
	97	97	0	0	0	–	–	–	–	–	
										Grand Total:	**14,952**

Core Performance Measure CM (e): Percentage of Environmental Resource Permitting (ERP) for which compliance inspections were conducted and of those inspected, percentage found to be in compliance
[Claudia Kugler]

The number of ERP compliance inspections conducted during FY2004, and the percentage of those in compliance, are shown in **Table 7-3**.

Table 7-3. Environmental Resource Permit compliance in FY2004.

Environmental Resource Permit Compliance	Number	Percentage
Total Engineering and Environmental Application Inspections	3,411	–
Total Number of Engineering and Environmental Compliance Inspections	7,385	–
Total Engineering and Environmental Applications in Compliance	6,227	–
Percentage Found to be in Compliance	–	84.5%
Total Environmental Application Inspections	1,121	–
Total Number of Environmental Compliance Inspections	1,787	–
Total Environmental Applications in Compliance	1,033	–
Percentage Environmental Inspections Found to be in Compliance	–	77%
Total Engineering Application Inspections	2,290	–
Total Number of Engineering Compliance Inspections	5,576	–
Total Engineering Applications in Compliance	5,194	–
Percentage Engineering Inspections Found to be in Compliance	–	86%

The above-listed data are from the SFWMD Environmental Resource Compliance Oracle database, Environmental Resource Compliance Access database, and paper-form checklists.

PERFORMANCE MEASURES FOR WATER SUPPLY

A key priority of the SFWMD is to implement water supply plan recommendations to ensure that adequate water supply is available to meet current and projected environmental and human water needs. The District is divided into four water supply planning regions:

- Lower East Coast
- Lower West Coast
- Kissimmee Basin
- Upper East Coast

Four regional water supply plans are in place and are being implemented to meet the water supply needs of present and future populations, agriculture, and natural systems, pursuant to the requirements of the Florida Water Resources Act. MFLs ensure the sustainability of water resources. Water Conservation and Alternative Water Supply projects are encouraged through a combination of strategies. Efforts are coordinated with local government comprehensive planning to create a linkage between land use and water supply planning.

The Upper East Coast Water Supply Plan was updated in FY2004. Updates for the remaining three plans – the Kissimmee Basin, Lower West Coast and Lower East Coast – are under way. The District has allocated $295.6 million in FY2005 to implement its regional water supply plans and to make 119.4 million gallons per day (mgd) additional water available. Regional water supply planning and implementation activities will result in 483.9 mgd being made available by FY2009. Included in these estimates are CERP projects with water resource development benefits. Additional information can be found in the Five-Year Water Resource Development Work Program, Chapter 4 of this volume.

The District is committed to the conservation of water through reuse. Reuse involves treating domestic wastewater and using the resulting higher quality reclaimed water for a new, beneficial purpose. Extensive treatment and disinfection ensures that public health and environmental quality are protected. The District encourages use of reclaimed water for many purposes including large-scale irrigation, urban and agricultural uses, wetlands creation, industrial needs, and groundwater recharge. Reclaimed water replaces substantial quantities of freshwater supplies. Over the past year, the use of reclaimed water was almost 225 mgd across the District.

The Alternative Water Supply (AWS) Funding Program was established by the Florida Legislature in 1995, and the District has responded by funding up to 50 percent of the total cost of capital improvement projects that help implement safe and cost-effective alterative water supplies. Since 1996, almost 340 mgd of additional water has been created with $28 million of District cooperative funding. In FY2005, the District will contribute $6 million to 28 water supply projects as part of the AWS Program. These projects, when completed, will produce 66.12 mgd. This will bring the total amount of water created by the AWS program to 406 mgd. See Chapter 5 of this volume for the AWS Annual Report.

The performance measures utilized in this annual report to evaluate the effectiveness of water supply provide indications of changes in water demand rates and reused water quantities as well as activities designed to protect water sources such as potable water wellfields.

CORE OBJECTIVE WS 1: Increase available water supplies and maximize overall water use efficiency to meet identified and existing future needs

Core Performance Measure WS 1 (a): Percentage of domestic reuse

[Michelle Pearcy/Mark Elsner/Curt Thompson]

The percentages of water reuse from 1999 through 2003 for the District, in total and by planning area, are presented in **Tables 7-4** and **7-5**, respectively.

Table 7-4. Percentage of water reuse from 1999–2003.

Performance Measure	Year				
	1999	2000	2001	2002	2003
Number of Treatment Plants	122	116	117	115	114
Number of Reuse Systems	118	111	111	110	111
Wastewater Treatment Facility Capacity (mgd)	1,014	1,012	1,013	1,018	1,036
Wastewater Treatment Facility Flow – Actual (mgd)	762	761	769	788	798
Reuse Capacity (mgd)	326	317	335	372	396
Reuse Flow – Actual (mgd)	180	190	197	201	219
Percent Reuse – SFWMD	24%	25%	26%	26%	27%
Percent Reuse – Lower East Coast Planning Area [1]	8%	9%	9%	10%	11%
Percent Reuse – Lower West Coast Planning Area [1]	84%	93%	89%	89%	83%
Percent Reuse – Kissimmee Basin Planning Area [1]	99%	99%	100%	100%	99%
Percent Reuse – Upper East Coast Planning Area [1]	44%	40%	48%	52%	61%
[1] Percent Reuse = Reuse Flow/Wastewater Treatment Facility Flow					

The above-listed data are from 1999–2003 Reuse Inventories published by the FDEP.

Table 7-5. Capacity and reuse ratios by planning area for FY2004.

Planning Area	WWTF		Reuse		Capacity Ratio [A]	Flow Ratio [B]
	Capacity (mgd)	Flow (mgd)	Capacity (mgd)	Flow (mgd)		
Lower East Coast	789	624	109	66	14	11
Lower West Coast	106	76	90	63	85	83
Kissimmee Basin	110	79	177	78	161	99
Upper East Coast	31	19	20	12	65	61
SFWMD Total	1,036	798	396	219	38	27
[A] Capacity Ratio = Reuse Capacity/WWTF Capacity [B] Flow Ratio = Reuse Flow/WWTF Flow						

The Wastewater Treatment Facility (WWTF) Capacity is the combined FDEP permitted treatment capacity for all facilities with a capacity of 0.10 mgd or greater. The combined volume of wastewater treated by these facilities is indicated under WWTF Flow. The Reuse Capacity is the combined permitted reuse capacity of these facilities, and the Reuse Flow is the combined volume of reclaimed water that was reused.

During 2003, the most recent year for which information is available, 27 percent of the wastewater treated was reused compared to a capacity for reuse in the District of 38 percent.

Most of the reuse in the District is for irrigation of golf courses, residential lots, and other green space and groundwater recharge. Using reclaimed water for irrigation requires higher levels of treatment than historically used disposal methods such as deep-well injection and ocean outfall. Water disposed comprises the difference between the Wastewater Treatment Facility Flow and Reuse Flow.

Core Performance Measure WS 1 (b): Gross per capita water use (public supply) by District and water supply planning area

[Michelle Pearcy/Curt Thompson]

An estimate of public water supply per capita used in the District during 2003 is presented in **Table 7-6**. The population served is estimated for 2004. Pumpage is given in million gallons per year (mgy).

For some systems, monthly pumpage and population served were not available, but the resulting difference in the total per capita usage is minor and the omission of this data from the calculation is not thought to affect the total usage. The Reedy Creek Improvement District is not included in the Kissimmee Basin or District totals, as the U.S. Geological Survey (USGS) classifies this water as commercial.

Table 7-6. Gross per capita public water supply for 2003.

Planning Region	Per Capita	Population Served	Raw Water Pumpage (mgy)
Lower East Coast			
Broward County	204	1,736,064	129,590
Miami-Dade County	159	2,284,182	132,807
Monroe County	211	80,766	6,238
Palm Beach County	263	1,105,265	106,288
Lower East Coast Total	**197**	**5,206,277**	**374,923**
Lower West Coast			
Lee County	222	399,306	32,443
Collier County	192	269,508	18,945
Hendry County	350	26,107	3,339
Glades County	654	5,986	1,430
Charlotte County	0	1,807	81
Lower West Coast Total	**219**	**702,714**	**56,238**
Kissimmee Basin			
Highlands County	46	4,897	83
Okeechobee County	82	27,563	823
Polk County	105	7,895	302
Osceola County	143	162,205	8,488
Orange County	390	263,365	37,543
Kissimmee Basin Total	**277**	**466,195**	**47,239**
Upper East Coast			
Martin County	316	97,969	11,300
St. Lucie County	135	149,709	7,379
Upper East Coast Total	**206**	**247,678**	**18,679**
DISTRICT TOTAL	**205**	**6,622,864**	**497,079**

Core Performance Measure WS 1 (c): Within each water supply planning region, the estimated amount of water supply to be made available through the water resource development component of the regional water supply plan, percent of estimated amount under development, and percent of estimated amount of water actually made available
[Michelle Pearcy/Jane Bucca/Curt Thompson]

Table 7-7 presents the amount of water that was estimated to be made available through the water resource development components of the regional water supply plans, which were published in 1998 and 2000, and the SFWMD Proposed Five-Year Water Resource Development Work Program, dated November 7, 2002.

Table 7-7. Estimated water made available and under development.

Water Supply Planning Region	Water to be Made Available (mgd)	As of September 30, 2004	
		Percent of Estimated Water Under Development	Percent of Estimated Water Actually Made Available
Lower East Coast	519	100.0%	4.5%
Lower West Coast	422	58.0%	16.9%
Upper East Coast *	129	100.0%	0.0%
Kissimmee Basin	390	81.0%	1.0%
Total Made Available	**1,460**		

* UEC Plan updated June 2004

The percent of this estimated water that has been made available and the estimated amount that was under development as of September 30, 2004 are shown above, except for the Upper East Coast Water Supply Planning Region, which uses June 30, 2004 information.

Core Performance Measure WS 1 (d): Within each water supply planning region, the estimated additional quantities of water supply made available through District water supply development assistance

[Michelle Pearcy/Jane Bucca/Curt Thompson]

Until 2002, eligible projects were limited to proposed alternative water supplies within a designated Water Resource Caution Area. During 2002, legislation was passed to allow for proposed projects in all areas. Prior to the legislation, the Kissimmee Basin Planning Region was not eligible due to its lack of the designation; however, it was incorporated into the Alternative Water Supply Program in FY2004. The estimated additional quantities of water supply that were made available through District water supply development assistance from 2000 through 2004 is presented in **Table 7-8**.

Table 7-8. Additional water made available through water supply development assistance.

Water Supply Planning Region	Water Made Available (mgd)					Water Estimated to be Made Available (mgy)
	2000	2001	2002	2003	2004	2005
Lower East Coast	19.71	5.35	26.21	34.51	53.61	39.19
Lower West Coast	21.80	38.74	12.50	8.20	30.59	11.24
Upper East Coast	9.36	0.00	2.17	1.00	8.33	5.02
Kissimmee Basin	–	–	–	–	7.70	10.67
Total	50.87	44.09	40.09	43.71	100.24	66.12

The above data were obtained from AWS applications filed from 2000–2004, and for applications proposed for 2005. To be eligible for the AWS Funding Program, projects must propose the development of capital facilities for effective and appropriate alternative water supplies.

CORE OBJECTIVE WS 2: Prevent contamination of water supplies

Core Performance Measure WS 2 (a): Percentage of surface water supply sources for which water quality attains the designated use

[Michelle Pearcy/Curt Thompson]

There are 83 total surface water supply sources located within the District. According to the 2002 305(b) Report published by the FDEP, 45 percent of these sources have good water quality ratings. Regulation, outreach, monitoring, and evaluation comprise the District's strategies for meeting the core water supply objective of preventing contamination of water supplies. **Table 7-9** shows the water quality ratings, sources, and ratios for surface water.

Table 7-9. Water quality ratios for surface water supply sources.

Water Quality Rating	Number of Sources	Percentage of Total
Good	37	45%
Fair	40	48%
Poor	1	1%
Not in FDEP Database (Marco Lakes)	5	6%
Total	83	100%

Five of the sources, the Marco Lakes, were not considered, as they are not in the FDEP database. The 2002 305(b) Report is the most recent publication containing the information for this performance measure.

SFWMD Performance Measure WS 2 (b): Percentage of public water supply wellheads subject to wellhead protection ordinances

[Michelle Pearcy/Curt Thompson]

The U.S. Environmental Protection Agency (through the reauthorization of the Safe Drinking Water Act), state agencies (through the enactment of administrative rules), and local governments (through the implementation of wellhead protection ordinances), strive to prevent groundwater contamination. The District's strategies for preventing contamination of water supplies include regulation, outreach, monitoring, and evaluation. **Table 7-10** indicates the number of public water supply wellheads that are subject to wellhead protection ordinances.

Table 7-10. Public water supply wellheads subject to wellhead protection ordinances.

County	Wellhead Protection Ordinances	Number of Public Water Supply Wells				
		2000	2001	2002	2003	2004
Palm Beach	Yes	605	626	588	586	572
Broward	Yes	394	424	440	449	317
Miami-Dade	Yes	255	281	177	201	273
Monroe	No	0	0	0	0	4
Glades	No	20	20	12	14	27
Hendry	No	40	41	34	41	82
Lee	Yes	393	362	414	426	271
Collier	Yes	165	201	176	229	187
Charlotte	No	24	24	18	18	160
St. Lucie	Yes	234	210	157	162	193
Martin	Yes	246	297	162	223	195
Orange	Yes	131	129	116	113	353
Osceola	No	136	156	105	97	190
Polk	Yes	19	23	10	11	696
Highlands	Yes	22	23	7	8	139
Okeechobee	No	68	68	17	17	75
Total		2,752	2,885	2,433	2,595	3,734

The number of public water supply wells in each county was obtained from District service centers and the District's permit database for the years 2000 through 2003. The FDEP provided these numbers as of October 30, 2003 for 2004.

PERFORMANCE MEASURES FOR FLOOD PROTECTION AND FLOODPLAIN MANAGEMENT

Flood protection within the District is provided through the facilities of the Central and Southern Florida Project, and by limiting land uses within identified flood-prone areas. Floodplain management is achieved by protecting and restoring natural features of floodplains.

The potential for excessive rainfall associated with a series of hurricanes during the summer of 2004 prompted the District to implement its pre-storm activities and protocols. The District closely monitored the projected storm tracks, along with water levels in regional canals, lakes, and water storage areas. The agency made preparations to enhance the ability of local drainage facilities to route excess runoff into the District canal system. Pumping stations throughout the region were readied to be activated as needed.

Due to the earlier effects of Hurricane Charley and above-normal rainfall during August, many areas of the District's 16-county region were already very wet by the time Hurricane Frances hit. Due to high canal levels, releases were made from coastal canals to help increase

storage availability in the Upper East Coast. Some local areas in the Kissimmee Basin experienced flooding due to Hurricane Charley and follow-up rainfall. The rains filled the lakes in the upper basin, which were at, or above, regulation schedule by the end of August. Maximum discharges were made to the Kissimmee River at that time. The Lower West Coast was saturated from Hurricane Charley and subsequent above-normal rains. All water control structures in southwest Florida, including the Big Cypress Basin, operated as intended.

Rainfall, water levels and sites prone to flooding were monitored around the clock by District field crews and staff at headquarters. Pump stations and other water control structures were fully operational, and adjustments were made as necessary in response to rainfall associated with Hurricane Frances.

Even with the District's standard pre-storm precautions, some localized flooding occurred in low-lying areas and areas with poor connections to the District's water management system. In some areas, actual rainfall amounts exceeded the capacity of the regional system to move storm water effectively.

Complete flood prevention is not possible in South Florida, especially given the potential for excessive rainfall associated with a hurricane. The regional system of canals and structures is designed to help reduce flooding levels and help shorten the duration of standing flood waters.

CORE OBJECTIVE FP 1: Minimize damage from flooding

Core Performance Measure FP 1 (a): Percentage of District works maintained on schedule

[Albert Basulto]

The District has developed and implemented an effective maintenance program that is continuously evaluated and upgraded. This program has allowed the original components of the C&SF Project to remain in operation. The Operations and Maintenance Business Operations quarterly reports show that 29,154 work orders were created and 23,742 were completed during FY2004. The percentage of District maintenance activities completed is 81 percent. This information was found in the District's Computerized Maintenance Management System.

SFWMD Performance Measure FP 1 (b): Number and cost of stormwater retrofit projects carried out by the District

[Service Center Directors]

Table 7-11 presents the number and cost of stormwater retrofit projects carried out by the District during FY2004.

Funding of local stormwater retrofit projects is one of the District's strategies by which it meets the core objective of minimizing damage from flooding. **Table 7-11** presents the number and cost of stormwater retrofit projects carried out by the District during FY2004.

Table 7-11. Stormwater retrofit projects for FY2004.

Service Center	Ad Valorem Funds		Pass-through Funds	
	Number of Projects	Cost	Number of Projects	Cost
Palm Beach	0	$0	0	$0
Broward	9	$3,345,000	5	$1,620,000
Miami-Dade	6	$1,450,000	22	$19,920,000
Keys	5	$1,767,800	0	$0
Fort Myers	11	$2,238,589	0	$0
Okeechobee	1	$250,000	0	$0
Martin / St. Lucie	1	$500,000	6	$1,686,750
Orlando (Osceola County)	10	$3,265,070	1	$900,000
Total	43	$12,816,459	34	$24,126,750

The above information was obtained from the District's service centers.

SFWMD Performance Measure FP 1 (c): Average number of days to complete Environmental Resource Permit review and issue a permit once the application is complete

[Claudia Kugler]

The District protects the supply and the quality of water resources by regulating with Environmental Resource Permits the management and storage of surface waters and the dredging or filling of wetlands. The average number of days to complete an Environmental Resource Permit review and issue a permit in FY2004 once the application was complete was 59.2 days for an individual permit and 44.7 days for a general permit. These numbers do not include projects on extended waiver by the applicants. The source of this information is the District's Permit Application Tracking System.

SFWMD Performance Measure FP 1 (d): Number of permit applications received

[Claudia Kugler]

For FY2004, 2,431 Environmental Resource Permit/Surface Water Permit applications were received. This includes individual permits, general permits, and all others. The data source is the District's Permit Application Tracking System.

SFWMD Performance Measure FP 1 (e): Number of pre-application inspections

[Claudia Kugler]

There were 219 Environmental Resource Permit pre-application reviews in FY2004. The data source is the District's Permit Application Tracking System.

SFWMD Performance Measure FP 1 (f): Number of permits issued

[Claudia Kugler]

There were 2,341 Environmental Resource Permits/Surface Water Permits issued in FY2004. This number includes individual permits, general permits, and all others. The data source is the District's Permit Application Tracking System.

CORE OBJECTIVE FP 2: Promote nonstructural approaches to achieve flood protection, and to protect and restore the natural features and functions of the 100-year floodplain

Core Performance Measure FP 2 (a): Number of acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired

[Fred Davis/Bill Helfferich]

Land acquisition is key to meeting this core flood protection objective of promoting nonstructural approaches to achieve flood protection and protecting the floodplain. The Save Our Rivers Act enables water management districts to acquire lands necessary for water management and conservation and protection of water resources. **Table 7-12** presents the SOR projects that have been identified by the District to minimize flooding. The total project size is presented along with the number and percentage of total acres acquired by the end of FY2004.

Table 7-12. Save Our Rivers (SOR) projects to minimize flooding.

Project	Project Size (Acres)	Total Acres Acquired	Percent Acquired
CREW	58,528	25,089	43%
East Coast Buffer	66,809	23,151	35%
Kissimmee Chain of Lakes	33,919	33,781	100%
Lake Marion Creek	17,300	7,036	41%
Loxahatchee Slough	1,425	1,424	100%
Nicodemus Slough	2,219	2,219	100%
Reedy Creek	30,000	5,838	19%
Shingle Creek	7,655	1,650	22%
Water Conservation Area*	853,874	N/A	N/A
Total	217,855	100,189	46%
*Water Conservation Area Project is not included in the total.			

The above data were obtained from the Save Our Rivers Land Acquisition and Management Plan and the ATLAS database. The WCAs are not included in the total for a number of reasons. First, they are not actually SOR projects, having been purchased long before the SOR program began. Second, the WCAs are so large that they would skew the results of any measure that is being quantified. Furthermore, the District's ownership in them actually is a combination of fee title and flowage easement.

PERFORMANCE MEASURES FOR WATER QUALITY

The District has many programs to monitor and improve surface and ground water quality. Surface Water Improvement and Management (SWIM) plans have been approved and adopted for Lake Okeechobee, Biscayne Bay, and the Indian River Lagoon. Key priorities for the agency include achieving water quality standards for the Everglades and reducing phosphorus inputs to Lake Okeechobee.

The protection and enhancement of Lake Okeechobee, Biscayne Bay, and the Indian River Lagoon are being achieved through multiagency research, monitoring, and management programs such as SWIM. Important in the District's water quality efforts is the establishment of pollutant load reduction goals (PLRGs).

Key to PLRGs is the amount of pollutant load reduction needed to render water fit for a given use. More specifically, PLRGs are the estimated numeric reductions in pollutant loadings needed to preserve or restore designated uses of receiving bodies of water and maintain water quality consistent with applicable state water quality standards. PLRGs are used to establish water quality goals, estimate in-lake nutrient processing, examine current and historic conditions, and develop MFLs.

PLRGs allow calculation of the maximum amount of pollutant that a water body can receive and still meet water quality standards. More specifically, total maximum daily load (TMDL) is a process whereby point source discharge permits are considered within the context of all pollutant loadings to a water body and the overall pollutant load reductions needed to achieve and maintain state water quality standards.

CORE OBJECTIVE WQ 1: Protect and improve surface water quality

Core Performance Measure WQ 1 (a): Percentage of water segments that fully meet, partially meet, and do not meet their designated uses

[Shawn Sculley/Carla Palmer]

Generally, every two years, since the late 1970s, the FDEP has produced a Florida Water Quality Assessment 305(b) Report, which provides an assessment of the quality of Florida's waters. The current draft of the 305(b) Report is under internal review at the FDEP; however, the FDEP provided information to the District for this performance measure. **Table 7-13** presents the percentage of water segments within the District that meet, partially meet, or do not meet their designated uses.

Table 7-13. Water segment designated uses.

Basin Study Unit	Indicator	Status	Large Lakes	Small Lakes	Streams
Kissimmee – Okeechobee Index Period May to December 2000	Chlorophyll *a*	Meets Designated Use	–	–	43.6
		Partially Meets Designated Use	–	–	12.6
		Does Not Meet Designated Use	–	–	43.8
	Dissolved Oxygen	Meets Designated Use	96.7	89.3	55.5
		Partially Meets Designated Use	3.3	3.6	24.6
		Does Not Meet Designated Use	0.0	7.1	19.9
	Fecal Coliform	Meets Designated Use	96.7	96.4	40.5
		Partially Meets Designated Use	0.0	0.0	25.0
		Does Not Meet Designated Use	3.3	3.6	34.4
	Trophic State Index	Meets Designated Use	53.3	53.3	–
		Partially Meets Designated Use	26.7	26.7	–
		Does Not Meet Designated Use	20.0	20.0	–
Southeast Florida Index Period May to December 2003	Chlorophyll *a*	Meets Designated Use	–	–	70.1
		Partially Meets Designated Use	–	–	2.8
		Does Not Meet Designated Use	–	–	27.2
	Dissolved Oxygen	Meets Designated Use	58.3	80.0	25.6
		Partially Meets Designated Use	33.0	16.7	62.2
		Does Not Meet Designated Use	8.3	3.3	12.2
	Fecal Coliform	Meets Designated Use	75.0	93.3	49.0
		Partially Meets Designated Use	16.7	3.3	18.3
		Does Not Meet Designated Use	8.3	3.3	32.7
	Trophic State Index	Meets Designated Use	75.0	86.7	–
		Partially Meets Designated Use	8.3	13.3	–
		Does Not Meet Designated Use	16.7	0.0	–
Everglades – West Coast Basin Index Period May to December 2002	Chlorophyll *a*	Meets Designated Use	–	–	60.9
		Partially Meets Designated Use	–	–	3.2
		Does Not Meet Designated Use	–	–	35.8
	Dissolved Oxygen	Meets Designated Use	86.7	96.7	55.8
		Partially Meets Designated Use	13.3	0.0	31.2
		Does Not Meet Designated Use	0.0	3.3	12.9
	Fecal Coliform	Meets Designated Use	100.0	100.0	76.1
		Partially Meets Designated Use	0.0	0.0	10.1
		Does Not Meet Designated Use	0.0	0.0	13.7
	Trophic State Index	Meets Designated Use	63.3	76.7	–
		Partially Meets Designated Use	3.3	16.7	–
		Does Not Meet Designated Use	33.3	6.7	–
Caloosahatchee – Fisheating Creek Index Period May to December 2001	Chlorophyll *a*	Meets Designated Use	–	–	88.9
		Partially Meets Designated Use	–	–	5.4
		Does Not Meet Designated Use	–	–	5.7
	Dissolved Oxygen	Meets Designated Use	88.0	68.0	72.1
		Partially Meets Designated Use	8.0	24.0	25.2
		Does Not Meet Designated Use	4.0	8.0	2.7
	Fecal Coliform	Meets Designated Use	96.0	80.0	79.1
		Partially Meets Designated Use	0.0	4.0	2.4
		Does Not Meet Designated Use	4.0	16.0	18.5
	Trophic State Index	Meets Designated Use	80.0	64.0	–
		Partially Meets Designated Use	16.0	24.0	–
		Does Not Meet Designated Use	4.0	12.0	–

Core Performance Measure WQ 1 (b): Number and percentage of SWIM and District priority water bodies for which pollutant load reduction goals (PLRG) have been established (SWIM water bodies must have an approved SWIM plan)
[Shawn Sculley/Carla Palmer]

Pursuant to Section 373.453, F.S., and Section 62-43.030, F.A.C., the District reviewed the approved SWIM Priority List for South Florida and determined that it no longer reflected current policy and funding conditions. Accordingly, the District established an updated Priority Water Body List, which is presented in **Table 7-14**. Criteria used in developing these priorities include water quality, biological and physical conditions, threats to use, protection of outstanding water bodies, coordination with local planning efforts, and feasibility.

Table 7-14. SFWMD Priority Water Body List (as of February 2003).

Tier 1	Tier 2	Tier 3
▪ Biscayne Bay ▪ Florida Keys ▪ Lake Istokpoga ▪ Lake Okeechobee ▪ Lower Charlotte Harbor ▪ Loxahatchee River ▪ St. Lucie Estuary	▪ Florida Bay ▪ Indian River Lagoon ▪ Lake Worth Lagoon ▪ Naples Bay/Gordon River ▪ Rookery Bay/Marco	▪ Lake Arbuckle ▪ Lake Butler ▪ Lake Weohyakapka ▪ Upper Kissimmee Chain of Lakes

This list guides District endorsement of locally sponsored restoration projects seeking legislative appropriation and District projects funded with *ad valorem* dollars. Within each tier, each water body is considered of equal priority.

Core Performance Measure WQ 1(c): Percentage of total stream miles and lake and estuary area in the District assessed for ambient water quality
[Shawn Sculley/Carla Palmer]

Table 7-15 presents the total stream miles and the total lake and estuary area within the District boundaries, along with the miles, or square miles, and percentage assessed. Assessed information was not available in time to meet the publication deadlines for this report.

Table 7-15. Ambient water quality.

Basin Unit	System Type	Number of Sites Sampled	SFWMD	
			Miles	Square Miles
Kissimmee Okeechobee	Estuary	N/A	–	–
	Lake	58.0	–	1,469
	Stream	43.0	2,382.6	–
Southeast Florida	Estuary	N/A	–	–
	Lake	42.0	–	2,423.9
	Stream	60.0	7,832.3	–
Everglades West Coast	Estuary	N/A	–	–
	Lake	60.0	–	316.0
	Stream	60.0	565.8	–
Caloosahatchee Fisheating Creek	Estuary	N/A	–	–
	Lake	50.0	–	332.9
	Stream	42.0	2,392.9	–
Total		**415.0**	**13,173.6**	**4,541.8**

The above-listed data is from the Integrated Water Quality Assessment for Florida: 2004 305(b) Report and 303(d) List Update (July 29, 2004 draft). Assessed miles and percentages were not available in time to meet the production deadlines for this report.

SFWMD Performance Measure WQ 1 (d): Number of SWIM plans being implemented according to SWIM plan schedules

[Shawn Sculley/Carla Palmer]

SWIM plans have been approved for the Indian River Lagoon, Lake Okeechobee, and Biscayne Bay. All three plans are being implemented on schedule. Much has been accomplished in addressing the issues, goals, and objectives of the plans, including measurable improvements in water quality.

SFWMD Performance Measure WQ 1 (e): Number and percentage of permitted systems inspected through the ERP program, and percentage of those inspected found in compliance with permit conditions

[Claudia Kugler]

The number and percentage of permitted systems inspected through the ERP program and the percentage of those inspected found in compliance with permit conditions is discussed under Core Performance Measure CM (e).

CORE OBJECTIVE WQ 2: Protect and improve groundwater quality

Core Performance Measure WQ 2 (a): Improving, degrading, and stable trends in groundwater quality

[Linda Lindstrom/Carole Maddox/John Lukasiewicz]

The District manages regional groundwater to protect the resource and meet the full range of natural systems and human water needs. Water quality standards, including those for groundwater, are developed by the FDEP, which has the additional responsibility of ensuring that these standards are enforced. The FDEP Watershed Monitoring and Data Management section has released groundwater quality trend data from 1991–2003 for the following parameters:

Alkalinity	Dissolved Nitrate-Nitrite	Residuals
Color	Dissolved Oxygen	Temperature
Depth to Water	Dissolved Phosphate	Total Dissolved Solids
Dissolved Ammonia	Dissolved Phosphorus	Total Organic Carbon
Dissolved Iron	Enterococci	Turbidity
Dissolved Nitrate	Fecal Coliform	Turbidity (field)

All parameters analyzed for the network showed results that were stable or improving throughout the SFWMD, except for the following trends that were degrading:

Lower East Coast Counties

Broward	Dissolved Ammonia, Dissolved Oxygen, Temperature
Broward and Miami-Dade	Depth to Water, Turbidity (field)
Miami-Dade	Dissolved Nitrate-Nitrite

Lower West Coast County

Collier	Turbidity (field)

Core Performance Measure WQ 2 (b): Improving, degrading, and stable trends in nitrate concentrations in springs

There are no springs within the SFWMD's boundaries.

PERFORMANCE MEASURES FOR NATURAL SYSTEMS

The District is preserving, enhancing, and restoring the water resource-related natural systems within its boundaries. Native ecosystems along with their water resource-related functions are being preserved. Altered ecosystems are being restored where appropriate, along with their resource-related functions.

Recommendations in the regional water supply plans require establishment of MFL criteria, development and implementation of recovery strategies, and establishment of a system for monitoring MFLs. Additional information on MFLs is included in the Five-Year Water Resource Development Work Program (see Chapter 4 of this volume).

By law, MFLs are the flows or levels at which further withdrawals would be significantly harmful to the water resources or ecology of an area. MFLs are specified in agency rules as numbers representing flows or levels. MFLs guide water resource and water supply development to ensure water resource sustainability for people and the natural environment. They also assist in making water use and permitting decisions.

The District is committed to reducing the proliferation of exotic plant infestations. Exotic control consists of the proper application of various environmentally acceptable chemical herbicides combined with mechanical techniques performed by staff or private contractors. Cooperators who manage District lands under contract or lease are encouraged to apply a similarly aggressive approach to exotic plant control.

CORE OBJECTIVE NS 1: Maintain the integrity and functions of water resources and related natural systems

Core Performance Measure NS 1 (a): Number and percentage of established minimum flows and levels being maintained, consistent with established recovery or prevention strategies

[Michelle Pearcy/Joel VanArman]

The District established MFLs for the Everglades, Lake Okeechobee, the Biscayne Aquifer, the Lower West Coast Aquifer System, and the Caloosahatchee Estuary in September 2001. The St. Lucie Estuary (SLE) MFLs were established in September 2002. MFLs for the Northwest Fork of the Loxahatchee River were established in December 2002. To date, a total of seven MFLs have been established. Public workshops were conducted in 2004 to support the development of MFL technical criteria for south-central Biscayne Bay. Each MFL technical document includes an MFL recovery plan that provides a description of the programs, projects and schedules that will meet the MFL.

A water management plan is recommended for the Lake Istokpoga–Indian Prairie Basin. Current regulation and minimum operation schedules will need to be considered and an MFL established for Lake Istokpoga. The effort to develop a management plan for the Lake Istokpoga–Indian Prairie Basin has been combined with the District's efforts to revise the operational schedule for Lake Istokpoga and the identification of water storage basins north of Lake Okeechobee. The regulation review and the basin determination are scheduled for completion in FY2005. Further, the effort to set an MFL for Lake Istokpoga is expected to be completed in FY2005, and will be incorporated into any management plan.

Data to determine how well these MFLs are being met are being compiled and analyzed. In most cases, five to 10 years of data will be needed to determine how well the MFLs are being maintained.

Core Performance Measure NS 1 (b): Number of minimum flows and levels by water body type established annually and cumulatively

[Michelle Pearcy/Joel VanArman]

The District established five minimum flows in September 2001. These included one wetland (the Everglades), one lake (Lake Okeechobee), one estuary (the Caloosahatchee Estuary), and two aquifers (the Biscayne Aquifer and the Lower West Coast Aquifer System).

In September 2002, MFLs were established for an additional estuary (the St. Lucie Estuary). MFLs were completed for one river (the Northwest Fork of the Loxahatchee River) in December 2002. To date, a total of seven MFLs have been established.

Core Performance Measure NS 1 (c): Percentage of minimum flows and levels established in accordance with the previous year's schedule

[Michelle Pearcy/Joel VanArman]

During 2002, the District established MFLs for the Northwest Fork of the Loxahatchee River. During 2003, the District's governing board adopted these MFLs and mandated a minimum flow of 35 cubic feet per second over the Lainhart Dam in Jupiter. These were important steps toward protecting the resource. The MFL defines the point at which additional withdrawals can cause significant harm to the resource or ecology of the area.

MFLs are a regulatory tool designed to ensure that future water withdrawals do not impact the water body. Water reservations are another water management tool to protect the resource. Initial water reservations for the Loxahatchee River will cover existing water. The District's goal is to establish this number by the spring of 2005.

The District will follow a state/federal process for reserving the additional water that becomes available when Everglades Restoration projects are completed. MFL criteria will be revisited after restoration goals and seasonal flow criteria have been defined and a water reservation has been established. The schedule for establishing MFLs is presented in **Table 7-16**. This list is published pursuant to Section 373.042(2), F.S.

Table 7-16. Schedule for establishment of Minimum Flows and Levels (MFLs).

Priority Water Body	Year	
	Scheduled	Established
Everglades	2000	2001
St. Lucie River and Estuary	2001	2002
Biscayne Bay	2004	–
Biscayne Aquifer	2000	2001
Florida Bay	2005	–
Loxahatchee River Tributaries	2007	–
Loxahatchee River and Estuary	2001	2002
Southern Coastal Biscayne Aquifer	2004	–
Caloosahatchee River and Estuary	2000	2001
Estero Bay	2006	–
Water Table Aquifer	2004	–
Lower West Coast Aquifer	2000	2001
Kissimmee River	2006	–
Lake Kissimmee	2006	–
Lake Tohopekaliga	2006	–
East Lake Tohopekaliga	2006	–
Alligator Lake	2006	–
Lake Jackson	2006	–
Lake Rosalie	2006	–
Cypress Lake	2006	–
Lake Hatchineha	2006	–
Lake Pierce	2006	–
Lake Marian	2006	–
Fish Lake	2006	–
Lake Istokpoga	2004	–
Lake Butler Chain of Lakes	2008	–
Floridan Aquifer	2004	–

Lake Istokpoga currently operates on a regulation schedule based on minimum levels; the District will revisit these existing minimum levels upon completion of the USACE regulation study due in 2004. MFLs for Florida Bay, based on the 2002 update to the priority list, are scheduled for 2005. Sections 120.54(3)(a) and 373.042(4), F.S., direct the establishment of MFLs and scientific peer reviews of the criteria for water bodies on the list, which the District voluntarily conducts.

Core Performance Measure NS 1 (d): Total acres of wetlands or other surface water authorized by ERP to be impacted, and acres required to be created, enhanced, restored, and preserved

[Claudia Kugler]

During the ERP application review process, wetlands are evaluated both on and adjacent to the project site. Proposed wetland impacts are analyzed to determine whether they can be reduced

or eliminated. If proposed wetland impacts are determined to be permitted, compensation for the loss of the wetland functions generally is accomplished through mitigation. For FY2004, there were 9,562 existing and 2,073 impacted total wetland acres. There were 5,910 acres preserved/enhanced; this number does not reflect the number of "undisturbed" wetland acres. Furthermore, there were 991 created/restored acres, 1,160 upland compensation acres, and 8,061 total preserved/created/uplands acres. The source of this information is the District's Permit Application Tracking System.

SFWMD NS 1 (e): Acres of wetlands preserved as a percent of wetland acres reviewed through ERP applications; acres of wetlands reviewed; acres of wetlands impacted; acres of wetlands preserved; and acres of wetlands mitigation (may include wetlands preserved onsite)
[Claudia Kugler]

Mitigation consists of restoration or enhancement of existing wetlands, creation of new wetland habitat, or a combination of these methods. The following percentages for this District performance measure were calculated for FY2004, using the numbers presented in performance measure NS 1 (d) above:

- Preserved/created as a percentage of wetland acres reviewed 72 percent
- Impacted as a percentage of wetland acres reviewed 22 percent
- Total acres of mitigation for each acre of wetland impacted 389 percent

The data source for the numbers used in these calculations is the District's Permit Application Tracking System.

CORE OBJECTIVE NS 2: Restore degraded water resources and related natural systems to a naturally functioning condition

Core Performance Measure NS 2 (a): Acres of invasive non-native aquatic plants in inventoried public waters
[Dan Thayer]

District staff refers the reader to the FDEP's regional aquatic biologists' inventory of the amount of acreage containing invasive non-native aquatic plants in public waters in FY2004. The survey data of total acres within the District's boundaries is collected biennially by the FDEP. The plants of concern are hydrilla, water hyacinth, water lettuce, and hygrophilia. The District neither collects nor tracks this information, and suggests that the reader might find Core Performance Measure NS 2 (b) and 2 (c) to be of use.

Core Performance Measure NS 2 (b): Acres of District-managed lands infested with invasive non-native upland plants by degree of land coverage
[Fred Davis/Bill Helfferich]

The District continues to cooperate with other agencies to control the spread of exotic plants throughout South Florida through the use of mechanical and chemical controls and identification of biological controls. **Table 7-17** presents the status of exotic plant control on SOR lands managed by the District as of September 2004.

Table 7-17. Status of exotic plant control.

Area	Total Acres	Infested Acres	Acres – Level of Maintenance		
			Low	Medium	High
West Coast Region					
CREW	25,089	25,000	19,080	3,920	2,000
East Coast Region					
DuPuis	21,875	17,000	10,000	6,000	1,000
Everglades					
Model Lands	6,440	5,000	2,000	2,000	1,000
Southern Glades	38,000	5,600	3,000	1,700	900
Kissimmee/Okeechobee Region					
Kissimmee River	51,993	10,000	3,000	5,000	2,000
Upper Lakes Region					
Lake Marion Creek	7,036	1,000	1,000	–	–
Lower Reedy Creek	5,838	3,000	2,000	1,000	–
Upper Reedy Creek	6,736	500	500	–	–
Shingle Creek	1,650	1,200	1,200	–	–
Upper Chain	33,781	15,000	12,000	2,000	1,000
Total	**198,438**	**78,300**	**53,780**	**21,620**	**7,900**

There were 78,300 acres of lands managed by the District that were infested with invasive non-native upland plants. The District manages 53,780 acres which require low maintenance to control exotics; 21,620 acres which require medium maintenance for control; and 7,900 acres which require high maintenance to control.

Core Performance Measure NS 2 (c): Acres of District-owned lands identified in land management plans as needing restoration, acres undergoing restoration, and acres with restoration activities completed

[Fred Davis/Bill Helfferich]

Land management under the SOR Program focuses on hydrologic restoration, prescribed burning, exotic plant control, and habitat protection and enhancement. **Table 7-18** presents the status of the District's Save Our Rivers restoration projects as of the end of FY2004.

Table 7-18. SOR restoration projects.

Needing Restoration		Undergoing Restoration		Restoration Complete	
Area	**Acres**	**Area**	**Acres**	**Area**	**Acres**
Shingle Creek	1,200	Loxahatchee River	300	DuPuis Reserve	4,000
Catfish Creek	600	CREW	1,088	Sandhill	875
Rough Island	1,000	Starvation Slough	160	Johnson Island	33
Lightsey	500	River Runt	10	Southern Glades	25
Gardner-Cobb Marsh	3,000			Loxahatchee Mitigation Bank	1,256
Pool A – Kissimmee	1,000				
Corkscrew Mitigation Bank	633				

Hydrologic restoration involves wetland restoration and the establishment of sheetflow conditions, where possible.

SFWMD Performance Measure NS 2 (d): Acres of land infested with invasive non-native upland plants by species inventoried

[FY2004: Dan Thayer, Future Years: Fred Davis/Bill Helfferich]

The District is actively continuing control efforts for melaleuca, Brazilian pepper, Old World climbing fern, Australian pine, and other exotic upland plant species. The District has made control of melaleuca (*Melaleuca quinquenervia*) a major initiative. For FY2004, 78,300 acres of lands managed by the District were infested with invasive non-native upland plants. Detail by species is not being tracked by the District, hence Core Performance Measures NS 2 (b) and (c) might be of interest to the reader.

SFWMD Performance Measure NS 2 (e): Acres of cattail coverage relative to District 1995 aerial photo maps

[Ken Rutchey]

Cooperative research studies have shown that cattail outcompetes sawgrass under conditions of elevated nutrients and altered hydropatterns. This natural systems performance measure addresses the acres of cattail coverage relative to District 1991 and 1995 aerial photo-derived maps. The results for aerial photographs are presented in **Table 7-19**.

Table 7-19. Cattail coverage in Water Conservation Area 2A.

Year	Number of Acres		
	Cattail	**Cattail: Dominant Mix**	**Cattail: Sparse Mix**
1991	1,042	5,652	6,822
1995	4,068	9,746	9,196
2003	4,899	9,093	15,299

There were no additional aerial photos during 2004, so reporting for this performance measure is unchanged since the 2003 Annual Report. While the spread of cattail continues in Water Conservation Area 2A (WCA-2A) in the Everglades Protection Area (EPA), the rate of expansion has slowed. Cattail growth may continue even as the long-term water quality

improvements are implemented due to phosphorus releases from the soil and until full hydrologic restoration is achieved.

SFWMD Performance Measure 2 (f): Percent increase in wading bird populations as measured by systematic reconnaissance flights

[Jamie Serino/Mark Cook]

Ongoing surveys of wading birds comprise a program that is documenting ecological changes that occur as a result of Everglades restoration activities. **Table 7-20** presents the numbers of five characteristic species of nesting birds documented in the Everglades during systematic reconnaissance flights.

Table 7-20. Nesting birds in the Everglades basin.

Species	Three-Year Running Average						Target
	1997–1999	1998–2000	1999–2001	2000–2002	2001–2003	2002–2004	
Great Egret	5,084	5,544	5,996	7,276	8,460	9,643	4,000
Snowy Egret and Tricolored Heron	1,862	2,788	4,270	8,614	8,088	8,123	10,000–20,000
White Ibis	5,100	11,270	16,555	23,983	20,758	24,986	10,000–25,000
Wood Stork	279	863	1,538	1,868	1,596	43,930	1,500– 2,500

There were 46,290 total nests documented in 2004; this is an 18.9 percent increase in total nests for the year over the three-year running average for 2003.